REPORT

BENGAL SECRETARIAT LIBRARY

OF THE

AGRICULTURAL COMMITTEE,

APPOINTED BY G.O., No. 686, DATED 25TH SEPTEMBER 1888.

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REPORT.

THE Government Order * appointing this committee requires "a comprehensive inquiry into the constitution and operations of the Agricultural Department, with the view of ascertaining what practical good it has done and is doing and what good it might do under other conditions." Attention is specially directed to fourteen points of inquiry.

* G.O., dated 25th September 1888, No. 686, Revenue.

2. We have accordingly held meetings for the receipt of evidence and for discussion on eighteen occasions; we framed interrogatories on all material points and issued them to 235 persons, official and non-official, besides forwarding them to the chief newspapers for publication; we have received and considered replies from persons and Associations and have examined witnesses orally.

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3. The history of the Department is detailed in Appendices B and C. Briefly, action was the result of a recognition by Government in 1863 of the absence of agricultural progress, of the absolute necessity for such progress, and of the duty of Government to foster and guide it. At first, it was sought to promote improvement by displaying European implements on a model farm, but experience soon showed that, under the conditions of Southern India, cautious inquiry, experiment, and research were necessary preliminaries to progress. Up to 1882, however, there was no Agricultural Department proper, though the work of a department was attempted by the Superintendent of the Government Farm and his Assistants, never more than two in number, under the control of the Board of Revenue. This was obviously a very poor substitute for a department with very extensive duties; the experts had full work in the duties of the farm, at which, as being the first and sole institution of its kind among the small landholders of Southern India, they were under the necessity of undertaking the most elementary work as a foundation for serious effort, while, in endeavouring to carry out the work of a department, these same officers, being without any agencies in the up-country districts, labored under almost insuperable difficulties in their attempts to carry on experiment, to deal with stock, implements, seeds and methods, to make tours of observation, to organize exhibitions, to extend agricultural education, to disseminate the results of experiments made at the farm, and to further positive improvements.

4. In 1882-83, however, as a result of the Famine Commissioners' Report, the Department was, to a certain extent, organized, a Director being appointed, who was one of the Members of the Board of Revenue; to him was committed the charge of the Department in its first departure, viz., that of inquiry and rural analysis as the primary objects of its work, and the introduction of measures of protection as they should be indicated; experiment was not however altogether prohibited; positive improvements were to be introduced when inquiry showed their feasibility. With these views, the Famine Analysis of the Presidency assumed the first place, and the chief strength of the Department in its agricultural experts has been utilized in this work; accounts were devised to meet statistical requirements; the kistbandi has been modified to suit agricultural needs; the prevention of cattle-disease as a chief measure of protection has absorbed much of the funds available; exhibitions have been reorganized and competitive and other trials of new implements and seeds have been held. In April 1884, the chief Agricultural officer and a staff of Assistants were, with the Saidápet College, transferred to the Educational Department. Practically little has been possible since 1883 in organized experiment or in direct efforts at improvement; the farm was abolished in September 1885, and since 1884 effort has been concentrated on the Famine Analysis and on the operations against cattle-disease.

5. Neither under the old nor under the new *regime* has there been any organization in the districts; no skilled agents have been available there, so that it has been impossible, except occasionally, to carry out with success those experiments and demonstrations in seeds, implements and methods which the Department desired. All

officers in wholly novel and distasteful operations, disheartened by the immensity of their task, and discouraged by the attitude of the ryots, yet appreciable good has been done; cattle-disease statistics are, partly by their efforts, in a fair way of becoming accurate; a very large number of ryots have at least learnt the principle of segregation as practised by Europeans, though the practice is as yet very rare; some sort of segregation has been known to natives from time immemorial, but has never been complete enough to do any good. Some confidence has also been awakened in European medicines. In this connection we would draw attention to the letters of Messrs. Hazelton and Dumergue (Appendix F), the former of whom writes as follows:—"I am glad to say that there are numerous instances in which the advice of the Stock Inspectors is carried out, and in nearly all the districts the ryots freely ask for help and medicines; also the Stock Inspectors are well-known to the ryots in many districts and their efforts are appreciated;" the latter says "in villages around Hosúr, where a Stock Inspector was working for some months, the ryots take our medicine and advice freely." Considering the novelty and distastefulness of the task, the smallness of the staff, the short time that it has been at work, its want hitherto of sufficient practical training and the defectiveness of the arrangement which leaves a Stock Inspector almost alone and with a whole district in his charge, we consider that the results are not altogether unsatisfactory.

Question 5.—The operations in connection with and the benefit derived from the stock-farm administered by the department, with financial results.

18. The fifth question relates to the stock-depôt recently started at Hosúr. The Department has never possessed a stock-farm, but a depôt, where young cattle could, after purchase, be reared and subsequently distributed for stud purposes, was sanctioned in 1885; a site was finally selected in 1887 near Hosúr, and in December 1887 some of the Saidápet farm stock were sent there together with a few subsequent purchases and the Amrat Mahal cattle from Devikulam and the Pálnis. The depôt was, however, closed by order of Government in November 1888, within a year from its formation, so that no results have been possible. The marginal table abstracts the cost; the amount shown for 1886-87, and part of that for 1887-88, was spent at Saidápet. The depôt having been closed, the cattle and sheep were disposed of at the late Salem exhibition.

Year.	Stock depôt.		
	Horned cattle.	Sheep.	Total cost.
			RS.
1886-87	33	113	787
1887-88	38	89	4,092
1888-89	31	69	1,534

Question 6.—Whether the breeding of stock can be properly or economically carried on by Government.

19. The sixth question refers to the breeding of stock by Government. On a consideration of the evidence and of the arguments adduced, we are strongly of opinion that stock-breeding should not be carried on by the Agricultural Department. We consider that, to a great extent, the existing breeds are suitable to their environments and to the work they have to perform; that in open and light soils, which are very general in this Presidency, heavy cattle are not required even for improved ploughs, and could not be fed, so that if supplied they would be wasted; that, where such cattle are required for heavy work, as for the black soils and for road traffic, they are in common use, even in districts where they are not bred; that supply should therefore be left to follow the demand; that for a Government Department to be successful, effective and economical, it would have to be on a very large scale, supplied with abundance of money, rigidly continuous in policy, and absolutely guaranteed an existence of many years; even then, the experiments might be failures whether in fact or financially. We believe, therefore, that it is neither necessary nor expedient for Government to undertake this operation; we believe that when, under the influence of demonstration and of education and of the decrease of wild pasture, fodder crops are grown, cattle are better managed and the desire for agricultural progress widens and intensifies, the breeds of cattle will improve without Government aid. For a fuller statement of our reasons, we would refer to paras. 61 to 66 of Appendix C with which we are in general accord. Our opinions in the matter of cattle-breeding are equally applicable to that of sheep-breeding.

20. We are further of opinion that pony-breeding should not form part of the duties of the Agricultural department. It has no appreciable effect upon the cultivating classes and cannot affect agricultural stability or efficiency; it will be long ere the advance in more suitable directions will permit of the devotion to this object of any part of the scanty funds available for the improvement of agriculture. While we regret to recommend the abolition of an experiment which bids fair to be successfully established, we feel compelled to do so for the reasons just stated.

21. The present staff of the Department are as noted in the margin; * their duties are given below:—

Question 7.—The duties of the officers employed under the department.

(*a*) The Assistant Director of Land Records and Agriculture;
(*b*) The Inspector of Cattle Diseases;
(*c*) The Deputy Inspector of Cattle Diseases;
(*d*) The Sub-Assistant Director of Agriculture;
(*e*) Six Agricultural Inspectors;
(*f*) Twenty-two Stock Inspectors.

(*a*) The Assistant Director has charge of the following duties:—
(1) he is the professional adviser to the Director and performs Secretarial duties;
(2) he has charge of all Famine Analysis work;
(3) he acts as special adviser to the Collectors at mofussil shows;
(4) he supervises travelling shows;
(5) he performs any Agricultural work in the Department which may be necessary from time to time, as the Director orders.

(*b*) The Inspector of Cattle Diseases—
(1) is the adviser of the Director on veterinary matters;
(2) has to supervise and direct the work of the Stock Inspectors; and
(3) has to train probationary Stock Inspectors for their posts.

(*c*) The Deputy Inspector of Cattle Diseases—
is in charge of pony-breeding operations under the orders of the Collectors of Salem, Coimbatore and the Nílgiris.

(*d*) The Sub-Assistant Director of Agriculture is practically an Assistant to the Inspector of Cattle Diseases, but is available for agricultural work on special occasions.

(*e*) The Agricultural Inspectors are employed almost solely in connection with the preparation of Famine Analysis, but may be deputed to such work as—
(1) the charge of travelling shows;
(2) the supervision of special experiments with seeds;
(3) assisting at mofussil exhibitions.

(*f*) The Stock Inspectors, of whom five are probationers, are allotted one to each district for cattle-disease prevention work under the orders and control of the Collectors. They are also held responsible for looking after any stud bulls, &c., sent out by the Department, and it is intended to utilize them in castrating operations.

22. In 1887 Mr. Benson suggested a combination of the functions of the superior officers of both branches so as to allow of better results being obtained with the small staff which it is at present possible to employ, but no change has been made, and the duties of the staff stand as noted above.

23. In the eighth question we are required to indicate a policy which, in our opinion, will increase the efficiency of the Department to the benefit of the agricultural community. We assume it as axiomatic that, in this country of assured peace and progressive population, where the State is, in effect, the landlord, and where the cultivators are petty proprietors empirical in their practice, isolated by their suspiciousness, and fettered by general ignorance, the active intervention of Government to lead and assist agricultural progress is absolutely necessary; that the Department which is to operate for this end, should, in view to success, possess large influence and knowledge, should be in close touch on the one hand with the existing administration, and on the other with the

Question 8.—The best means of increasing the efficiency of the Department, having special reference to the benefit of the agricultural community.

people with whom it has to deal, should have a definite policy, and should be thoroughly organized and properly equipped with supplies, with effective agents, and also with the means of testing its first results under varying conditions, and of disseminating and demonstrating successful results in the eyes of the people. But as we have briefly shown in paragraphs 3 and 5 *supra*, the Department has been lacking precisely in these conditions which are essential for success, and we desire therefore to record our opinion that the first condition and the best method of increasing the efficiency of the Department is to give it a declared policy, definitely laid down and adhered to, adequate grants of money and abundance of time to allow of results being obtained, demonstrated and accepted by the cultivating classes.

24. In expansion of this general expression of our opinion, we would point out the necessity—

(*a*) for the improvement of all aids, and the removal of all hindrances. to the stability and efficiency of agriculture;
(*b*) for inquiry and research;
(*c*) for experiment and demonstration;
(*d*) for the introduction of positive improvements;
(*e*) for a proper staff and organization;
(*f*) for a developed system of education both as regards school and college tuition and as regards the general stimulation of the agricultural public.

25. (*a*) *The improvement of aids and the removal of hindrances to agricultural stability and efficiency.*—While we regard the proper cultivation of the dry soils as of the first importance in that every inch gained by deeper tillage and by better soil-management not only adds, potentially, several millions of acres to the area of cultivation, but vastly lessens the chances of disaster from drought, we are aware that such improvement will be a slow process. But in irrigation we have ready to hand an immediate and approved aid to agriculture, and in view of the close prospective connection between the Agricultural Department and the cultivating classes, we would give the Department an advisory voice as to the restoration and development of irrigation works generally and would transfer that control over Minor Irrigation Works which is now exercised by the Land Revenue Members of the Board to its Agricultural Member. We would also draw attention to the desirability of stimulating the restoration of small works by the village communities.

26. We would next advert to the operations under the Land Improvement and Agriculturists Loans Acts. It is in evidence, and is a matter of experience, that little advantage is taken of the Government offers; a total of three lakhs is annually provided for loans at low interest, under the former Act to encourage permanent land improvements chiefly irrigational and especially wells, under the latter for more casual necessities, as for the purchase of cattle, seed, &c.; of this sum Rs. 1,17,541 were taken in 1887-88, the highest previous amount having been only Rs. 27,157. Numerous reasons are given for this failure,—delay, peculation and the rigidity of the conditions of repayment being the principal reasons assigned. Without discussing in detail the validity of the various reasons, we consider that there is evidence to show that the working of the Acts is not satisfactory. We advise that, as the matter is chiefly agricultural, the control of these operations be placed under the Agricultural Member of the Board with instructions to consider the propriety of altering the methods of inquiry and grant of loans, so as to minimize the objections now raised; such for instance as the employment of a special officer, and any advisable alteration of the rules.

27. The statements forwarded in answer to our interrogatories frequently mention disabilities produced by the operations of the Forest Department. Some hardships we consider to be unavoidable, being the result of necessary restrictions in the true interest both of agricultural progress and of future generations. It is, however, possible that restrictions may occasionally be too considerable, and that due effect may not have been given to the expressed intention of Government to afford free pasture for all purely agricultural and domestic cattle. Considering the intimate connection of forests and agriculture, and considering that the former exist primarily for the good of the latter, and are only secondarily sources of revenue, we are of opinion that this branch of administration should be placed under the control of the Agricultural Member of the Board of Revenue, if there are no administrative difficulties in the way.

28. It is further in evidence that the rules for wells in wet land, however well-intentioned, operate in some degree harshly, as when irrigation from such wells is charged for if the neighbouring work receives any—even the most infinitesimal—supply. We content ourselves with drawing attention to this matter, as we understand that the rules are tentative, and will form the subject of early report by the district officers.

29. Under the head of hindrances to improvements, two matters have been brought to our notice, which we consider important, inasmuch as they are adduced to prove that the tenure of land under the ryotwari system is not secure.

30. The first is that, according to a ruling of the High Court of Madras in 1876 (Fakir Mahomed *vs.* Tirumalachari, vol. I, Madras High Court Reports, page 205), the holder of land under Government is merely a tenant from year to year, and is liable to be turned out of his holding at the end of any year. This ruling is opposed to the policy and practice of this Government in dealing with its ryots, but as it has been adduced in the evidence taken by us as a reason for capital not being applied to the improvement of land, and as it has been authoritatively laid down as the law of the land by the highest court in the Presidency, we consider that all doubt on the matter should be removed by legislation.

31. The second matter is that there appears to be a feeling of mistrust regarding the finality of the grain values assigned to soils by the Settlement Department when revising assessments for the first time. It is feared that future revisions of assessments will be determined on a consideration not of prices only, but of soils also. A re-valuation of soils at each recurring revision would, it is said—and we think rightly said—be fatal to improvement. We believe that the present opinion of the Government is opposed to such a re-valuation, and is inclined to make the settlements permanent so far as the grain values of soils are concerned, but there has been no distinct avowal that this will be the policy that will guide future revisions of assessments, while the statement on page 110, vol. I of the Madras Manual of the Administration—that at future revisions soils are liable to re-valuation,—and the fact that sanction has been accorded to the reclassification of soils in the Chidambaram and Mannárgudi taluks of South Arcot, which were first settled in 1861-62 and are due to be resettled on the expiration of the thirty years' term of their first settlement in 1890-91, give a solid foundation for the want of confidence to which we have alluded. We consider therefore that Government should distinctly declare by legislation that, in any revision of assessment that may be made after the first, soils will not be revalued. In this way the value of his improvements will be absolutely secured to the ryot, for they will afford no basis for the enhancement of the Government demand upon him, and the stability of his tenure will be assured.

32. (*b*) *Inquiry and research.*—One of the weak places in agricultural policy, whether prior or subsequent to 1882, has been the comparative absence of searching and microscopical scrutiny into agricultural conditions and methods. Since 1882, the policy of inquiry has obtained greater attention, owing to the express instructions of the Government of India (paragraphs 22—35 of Appendix C), and the Famine Analysis of the districts, which is the only present method of organized inquiry, is now the chief duty of the Agricultural experts, including the Assistant Director and six Agricultural Inspectors. This analysis, being mainly statistical, does not call for the services of an Agricultural expert till each district is nearly complete, and the few experts available are much wanted in other directions, especially in that of a wide but searching investigation of agricultural methods and conditions. We therefore strongly advise that the Assistant Director and Agricultural Inspectors be entirely freed from the work of the Analysis, which should be conducted by a special account staff who will do the statistical work better and more quickly; the final results can then be submitted for the scrutiny and observations of the chief expert. Specially-selected members of the Inspectorate thus set free, should be detailed for a minute study of the various districts, their work being carefully mapped out and closely supervised by European experts whose duty, among other matters, should be to prepare, as experts, detailed reports on agriculture and rural economy. In this way, we consider that on the one hand, the requirements of a Famine Analysis will be quickly met, and on the other, that the further needs of a minute knowledge of district conditions and practices will tend to be secured.

33. In view to check and add to this knowledge, we consider that a complete set of queries should be prepared on specific subjects and issued to trustworthy sources of information; the answers to be collated into monographs and reports. We would also suggest the offer of honoraria for the best contributions on given subjects.

34. (*c*) *Experiment and Demonstration.*—From the records of the Saidápet farm, it is clear that valuable facts were sufficiently established there to justify its existence; these will be found in paragraph 37 of Appendix C. Not only were positive facts established, but numerous methods in which agricultural practice can certainly be improved were indicated, though further inquiry and experiment are no doubt necessary to determine the precise modes in which improvements should be carried out and the form they should take. These facts and suggestions for improvement are all of the very first importance to an efficient and progressive agriculture, and their establishment for the varying conditions of the country and their decisive demonstration to the ryots, are therefore matters of primary necessity; we are satisfied that the chief of them are absolutely essential to agricultural progress. Such are the following:—

(1) The results of shallow tillage especially in years of drought, and the prophylactic effects of deep tillage; (2) the thorough tillage rendered possible with a moderate rainfall by reason of the rapidity in action of improved ploughs; (3) the crop-results, especially in years of poor rainfall, from the power to utilize scanty rain to the best advantage by the rapidity of the improved ploughs; (4) the use of the country seed-drill as effecting a probable saving in seed, and permitting economical after-cultivation; (5) the possibility and effects of cheap green manuring upon dry soils deficient in humus; (6) the proper management of customary manures, the use of neglected manures, and the possibility of growing cheaply green manure for wet lands; (7) the results of new seed; (8) the causes of low produce and the proper methods in the cultivation of cotton, cereals, and general produce; (9) ensilage; (10) the better manipulation of wet lands, especially in the matter of the subsoil and use of water; (11) the ploughing of land immediately after harvest whether on wet or dry lands, to enable the growth of a catch-crop or a thorough fallow; (12) the better management of cattle in health and disease, including the growth of fodder crops, hedges, trees, and shrubs. The possibility of improvement in these practices is indicated both in the extract from Mr. Benson's reply to the Famine Commission contained in paragraph 37 of Appendix C and in his Examination before this Committee on the 20th March (Appendix J, pages 262 and 263 *infra*).

35. Experiments will, however, be absolutely valueless unless they are reiterated, continuous, long-sustained, controllable, patiently and intelligently conducted, and under observation and record by skilled observers; demonstration must be clear, continuous and brought alongside of the ryot. The history of past experiments shows conclusively that it is generally useless to entrust experiments to the officials of other branches or to ordinary ryots; the latter are usually indifferent, and the former too busy and too inexperienced, while it is impossible to secure continuity even for a couple of years. Hence we are convinced of the urgent necessity for experimental and demonstration farms, to be established whenever and wherever suitable superintendents, thoroughly acquainted with the conditions of the country, can be obtained; a few such superintendents are now declared to be available, while the cost of the experiments will be moderate. The farms need not be expensive, or more than 30 acres in extent, nor would it usually be necessary to acquire the land outright. No great number could be established immediately, but we are informed that five or six could be started at once, and one in every accessible district within two or three years if superintendents are properly trained and proper supervision is provided. For specific experiments, as in tobacco-curing, cotton-growing, &c., we would also recommend experimental stations. In this connection we would refer to paragraph 112 of Appendix C, where the objects and reasons of such farms will be found in detail. We may also point out that a very similar scheme was accepted in 1871, and that, though it was never carried out, it was the basis of subsequent developments which finally overlaid the original design.

36. We are not, however, generally in favour of a Central farm at present, though we think that it may be advisable hereafter to work one of the proposed farms as a Central farm for further research, and for the suggestion of further experiments on the District farms.

37. In addition to these farms and stations, we would urge that Local Boards, local Associations and private individuals of standing be encouraged by advice, by giving the help of experts, by the award of prizes and honoraria, by grants-in-aid, &c., to carry on experiments and demonstrations; and that, in all cases, the results of successful trials should be widely and persistently published.

38. (*d*) *Introduction of positive improvements—Seeds.*—There is evidence before the committee—and we note that similar evidence was recently given before the Mahájana Sabha—that the bulk of the ryots use inferior seed; that, in some parts of the Presidency, seeds are procurable which better suit present conditions, arrive earlier at maturity, and give better outturns than seeds in use in other parts; that foreign seeds have been introduced which are not only successful, but give better results than indigenous seeds, and that others are known and will probably be useful. It is also inferrible that seed has degenerated by in-breeding and by continued growth on the same soils, and on inferior soils in an inferior manner. It is not, however, possible for ordinary ryots to hear of or to procure better indigenous or exotic seeds; this can only be done either by rich land-holders or by a Government Department. In the general absence of the former, we consider it necessary for the latter to undertake the duty of introducing and distributing seeds by sale or otherwise. Experiments on exotic or quasi-exotic seeds should be conducted on the experimental farms already recommended: at first on small experimental plots to ascertain the best classes of seed suitable to given conditions. Seeds found suitable should afterwards be produced on a larger scale, acclimatized if necessary, and distributed. For reasons elsewhere stated, it is useless to continue the method of distributing seeds to private individuals or others who have neither time nor interest in the matter; experiments may, however, be made through carefully selected land-holders of intelligence and public spirit; many such are available. Where Associations exist, they should especially be utilized. Seeds may at first be distributed, gratis, as mere samples; afterwards they should be sold. We have evidence that the ryots are to some extent alive to the advantage of using selected grain for seed, and would purchase such if they knew where to do so. Printed information, with life-size illustrations in colour, as in seed-growers' catalogues, should be widely issued gratis, especially through Associations.

39. *Implements.*—It has been abundantly proved that improved ploughs effect a great saving in time, a matter of incalculable importance in years and districts of scanty rainfall; the same time and labor will suffice for a ryot to prepare, say, twice the area, or will suffice for him to go twice over the same area and thus prepare a deeper and finer seed-bed. The prophylactic effect of this deeper tillage is no longer a matter of doubt; it has been proved by Mr. Robertson at Saidápet, by Mr. Harman at Bangalore, and by Major Corbett in Upper India. Two witnesses have also stated in writing that their crops under the tillage of improved ploughs have been superior to those raised under the ordinary tillage. It is also certain that the draught of the improved ploughs is, when they are properly handled—a matter of no difficulty—even less than that of a country plough, while the price is within reach of all moderately well-to-do ryots. The only real difficulty is that of repairs, and this will speedily be got over if the ploughs are found to be otherwise suitable, while the repairs to the new light ploughs are extremely simple, as may be shown at the experimental farms. But in view of the facts that the time and labor-saving qualities of improved ploughs are now fairly recognised and that private enterprise is engaged in pushing such ploughs, we are of opinion that no further direct action by the Department is necessary. We consider, however, that the financial and crop results of improved ploughs should, as urged by the Board in 1884 (paragraph 53, Appendix C), be now ascertained and demonstrated on the experimental farms and otherwise. Other efforts in the matter of ploughs should be confined to the encouragement of private enterprise, by facilitating the grant of loans for their purchase under the Agriculturists Loans Act, by aiding, at the experimental farms, ryots who require repairs to their ploughs, by offering prizes for the best forms of implements, and for the best crops resulting from tillage by such implements, by spreading printed information, and by giving general assistance to travelling shows or other demonstrations undertaken by private firms and individuals. While the above is our opinion as regards ploughs, we consider that, in view of the results to be obtained—such as may, to some extent, be seen in the Ceded Districts where the seed-drill and bullock-hoe are

universally in use—seed-drills, bullock-hoes, water-lifts and oil-mills should be the subject of careful experiment and exhibition, and that substantial rewards should be granted for approved inventions.

40. *Cattle, sheep and horses.*—We have already stated that we cannot recommend stock or pony breeding as a duty of the Department, but in relation to the better management of cattle whether in health or disease, there is a vast field for work of the very highest usefulness. We have adverted above to the necessity for the special growth of fodder crops for cattle; there is no subject upon which experts are more unanimous and experience more convincing than this; it is essential that the ryots should learn that cattle-food can and ought to be grown as part of the regular farm practice, and that, by reason of the conflicting demand for increased arable cultivation, the common wild pasture system is no longer sufficient in Southern India as a means of sustaining cattle. We therefore consider that, in view of this question and of the cognate question of ensilage, a considerable part of the experiments at the farms should be devoted to these matters which, of themselves, are of sufficient importance to justify the establishment of such farms; and that the necessity for fodder-growing and for the supply of proper food and water for cattle, should be inculcated in every possible way whether by experiment, by Associations, by prizes for essays, by school teaching, or by printed information and the like. Moreover, we consider that for the use of the public, stud bulls and rams should be kept at experimental farms, where they will be under proper supervision and control. On the subject of dairying we do not propose to enter as there is no information before us, but we would record our opinion that the yield and proper treatment of dairy produce are amongst the most important subjects that an Agricultural Department can investigate.

41. *Cattle-disease operations.*—The present method of working and its defects have been mentioned above in paragraphs 16 and 17; it remains to state our recommendations as to future methods of working. In the first place, we would express our strong opinion that, in view of the immense mortality and consequent loss by preventible cattle-disease, it is a first duty of the Department to grapple with it. The recorded deaths from rinderpest alone in South Arcot in a single year (1887-88) were 34,704, and those for the Presidency were 121,741. If to these be added the unrecorded deaths and the immense number of cases that did not prove fatal, each of which, however, was a source of contagion and a loss of power, the virulence and destructiveness of this single disease are apparent. It has been said that, though the absolute mortality is great, the percentage of cattle which die from disease is small. The loss, however, is not to be gauged by a mere comparison of deaths with the total cattle of a district or of the Presidency; it is a matter of experience and of evidence that in several districts almost every village has been attacked, and that in many such villages, the cattle have practically been swept away, so that the ryots were in desperate straits for want even of ploughing cattle. The gauge of the mischief is the loss, over given areas, by preventible deaths and by loss of tilling power. In dealing with diseases which, owing to the customs of cattle-management and the conditions of the country, spread with immense rapidity, and find a victim in every stall, we deem it hopeless for many years to attempt directly preventive and curative work over the whole area of the country, and we are absolutely convinced that the present method of placing solitary Inspectors, themselves insufficiently educated and trained, in charge of a whole district with but little supervision and no possible chance of obtaining local influence over so vast an area, is radically wrong. We look forward to a time when there will be a highly trained Stock Inspector with a staff of salustry subordinates in every taluk, when the sense of the country will be actively on the side of the preventive and curative staff, and when better stock-management will remove the predisposing causes of epidemics. This is not yet within measurable distance, but we consider that the Department should at once bend its efforts to obtain as quickly as possible a considerably strengthened staff of Stock Inspectors, whose education and training will fit them to deal confidently with disease, to command the support of the ryots and to train men who,—whether as private practitioners or as subordinates,—will deal with disease in the villages, and be competent to take charge of hospital pounds. For the present, we recommend that Stock Inspectors should no longer be placed in

charge of particular districts, that one Inspector should be stationed at each experimental farm as it is established, and that the Director should have power to concentrate the rest in districts specially affected by disease. Under this arrangement, the Inspectors stationed at experimental farms will be able to secure local confidence and support; they will be able to start small veterinary hospitals for the treatment of cattle brought to them, and for the training of cow-doctors or subordinates; they will be able to supervise a moderate area round their hospitals, and to work the Cattle Disease Act in that area should it be put in force; they will also have further educational power as their knowledge and influence extend, and as veterinary education is made a subject of school-teaching or is called for by the ryots. We attach importance to this method as we are of opinion that the conjunction of positive treatment with the exhibition of proper cattle management on the farm will be very effectual as a means of education. To deal with cattle disease effectively—as by prevention—the agriculturist and stockman are at least as necessary as the veterinarian.

42. In the direct dealing with disease, the Director will, by his power of concentrating the remaining Stock Inspectors in one area, be able to deal more hopefully with infected districts, and to properly work the Cattle Disease Act which, for want of sufficient staff in the infected areas, has never yet been fairly tried.

43. We would also bring to notice that epidemics are spread—sometimes wilfully—by the present methods of dealing with carcases. In this connection we would specially advert to Board's Proceedings, No. 136, dated 23rd March 1889 (Revenue Settlement, Land Records and Agriculture), and the papers read therein, upon the working of the Cattle Disease Act. The evidence in these papers, coupled with the personal experience of this Committee, satisfies us that unless power is given by fresh legislation to prevent the intentional or negligent infection of the pasture-grounds, commons and water-supply by the refuse of diseased animals, it will be hopeless to deal satisfactorily with cattle-disease: the only remedy is in the destruction of the entire carcases of cattle which die of contagious disease. While a certain class has a distinct interest in the death of as many cattle as possible, it will always be probable that disease will be at least negligently spread; apart from this, however, the disposal of carcases as the most dangerous foci of contagion, demands strong action. It may be impossible to destroy living centres of contagion, but it is perfectly possible to deal with them when dead. We therefore commend this matter to the most serious consideration of Government.

44. *Organization and Staff.*—Our opinion as to the necessity for an extended intervention by Government in the cause of agricultural progress has been indicated above, and it remains for us to state the staff which appears to be absolutely necessary.

45. So far as the subordinate staff is concerned, we can merely state in general terms that the establishment of experimental farms, coupled with the proposed agricultural survey of the several districts, will demand an increase in the staff of Agricultural Inspectors. There are at present six in actual work, five of whom have two years' experience; qualified graduates of the Saidápet College are available for practical training, and could be made efficient in two or three years.

46. In the matter of their practical training—a matter which neither is nor can be completely dealt with at the Saidápet College—we recommend that, after leaving Saidápet, men intended for the service of Government in the Agricultural Department, should spend at least two years on the experimental farms before being permitted to take up the superintendence of farms, and that a further year should be spent in a careful tour of observation in the area where they will be finally located. Without some such training the Agricultural Inspectors will not be in a position to satisfy the conditions of their appointment.

47. Under the proposals for dealing with cattle disease, a much stronger staff of Stock Inspectors will be necessary, while their training must be enlarged and made more practical. It may be possible by an alteration of pay and by establishing grades to effect some economy upon present cost, but in view of the nature of the employment we do not anticipate any great saving. We have stated our views strongly as to the

necessity for an increased power of dealing with this destructive factor of agriculture, and for this end a larger supply of funds will be necessary. The training of these men is dealt with in paragraphs 81 to 87 *infra*.

48. The superior staff for the due supervision of these subordinates requires strengthening. In the Agricultural branch proper the Department possesses but a single European expert (Mr. Benson), who has now 15 years' service; there is no officer whatever to take his place when he is absent on leave or otherwise, or to assist him in the extended operations contemplated. We consider that a second expert is therefore necessary, and we are strongly of opinion that this second officer should at present be a trained European. In a newly-organized Department with novel and pioneer duties, it is essential that the chief experts should not only be men of large knowledge and practical experience in the methods of other countries, but that they should have organizing, controlling and initiative power. We therefore recommend that the Secretary of State be addressed in view to obtaining an officer of proper training and of practical knowledge, and that, if possible, he should, before being sent out, visit several of the countries of Europe with a view to noting the work of their Agricultural Departments, especially in their action upon the actual cultivators.

49. The superior staff of the Cattle-disease Department will require no present strengthening should our proposal be accepted to abolish pony-breeding as a duty of the Agricultural Department, as in that case the Deputy Inspector of Cattle-diseases (Mr. Shunker) will be set free for his proper duties, and will, with the Sub-Assistant Director, supply all necessary supervision under the Inspector. But should our proposal not be accepted, we consider it absolutely necessary that a second Veterinary expert—exclusive of the officer proposed in paragraph 81 *infra* as Veterinary Vice-Principal of the Agricultural College—should be obtained from England, as it is impossible for a single officer to grapple with the task of supervising these operations throughout the Presidency.

50. Proposals have been made to establish an Advisory Board who would assist the Director on the one hand by their advice and information, on the other by interpreting his views to their Departments or to the public, but who would have no executive power. Another form of the proposal is that there should be a Consultative Board which would be the intermediate agency between the official Department and the public for the formation and stimulation of local Associations, which, in turn, as they developed, would supply members for the Consultative Board. We are not of opinion that an Advisory Board is necessary or feasible, but we consider that a Consultative Board should be constituted as we think that it may tend to the formation and strengthening of local Associations. This Consultative Board would take the form of a Central Association similar to that which has been found successful in the North-West Provinces (Report of the Agricultural Department for the North-West Provinces for 1886).

The formation of Associations is in consonance with the express ruling of the Government of India "that it should be the earliest ambition of the Agricultural Department to secure the active aid of those members of the native community who are sincerely interested in agriculture, seeing that it is by the community alone that agricultural improvements can be effected on a large scale; that many of its members have experience, influence and capital, and are acquainted with the oftentimes hidden reason of apparently perverse or illogical processes, so that by their aid might be developed the true policy of progress in improving and adding to indigenous conditions without that subversion of ideas and methods which is likely to accompany the introduction of exotic reforms." Hitherto, however, local Associations have failed, not necessarily because material was not available, but because—to apply the words of Sir J. Strachey—"the efforts of individual district officers, although often exerted with great earnestness, have failed to meet with the success which they have deserved, because they were spasmodic and not persistent; governed by the accidental bent of individual minds, and not directed by a central agency towards a uniform end." (Minute of 1874 relative to the establishment of an Agricultural Department for the North-West Provinces). Viewing the matter in this light, we consider that the formation of local Associations is most important and should be proceeded with whenever and wherever they can be constituted. They will, by their ramification into

the villages, establish that close connection between the Department and the cultivating classes which is greatly wanted; they will be the interpreters between modern knowledge and ancient experience, will excite and stimulate original thought, carry on experiments, and render possible a system of local farm competitions which will go far to arouse the ryots to the needed improvement of their practice. We would not, however, have these Associations as mere official appanages, and it is for this reason, as well as to secure persistent effort, and a continuous and uniform policy, that a Central Association may be an important factor in the plan. It may be possible also that Local Boards should become the *nuclei* of local Associations.

51. (*f*) *Education.*—We shall deal with college and school education in our reply to questions 9 to 12, and will here advert only to such other matters as are educational in the sense of stimulating thought and inducing improvement. Such are exhibitions and other prize systems, the grant of honours and rewards, and the dissemination of information.

52. In paragraph 13 *supra* we have briefly mentioned the general disbelief in the success of exhibitions and shows on the lines on which they have hitherto been conducted, and in their suitability to present conditions. The evidence before us, which gives both official and non-official experience, is almost unanimous in rejecting exhibitions of the present class, as a means of educating ryots who do not possess the competitive and commercial spirit, and of whom not one in a thousand ever hears of the show. There is also much evidence that the prizes are, in the majority of cases, taken not by the producers, but by mere purchasers of samples; the prizes themselves are, moreover, too insignificant, the chance of winning one is far too small, and the connection with improvements in cultivation is too indistinct to afford the smallest inducement towards improvement. In the matter of stock, the inducement afforded even by local shows, as in Nellore, is doubtful; most excellent cattle have been bred there from time immemorial, and we cannot say that the breeds have been improved by the local shows. We are therefore strongly of opinion that the present system of exhibitions has had and will have no result, owing to its inability to excite the interest of the ryot, to stimulate his hopes and desires, or to arouse competition; and we recommend therefore that it should cease.

53. For the most part the ryot's world is his village, and inducements must therefore be brought down to the village; they must display to him, with some permanence, the direct and tangible outcome of his own or his neighbour's efforts in ways which he can see and understand, and must appeal to the spirit of local emulation which exists in the village and between villagers. The system of giving prizes for fields or farms or for specific items of farm-management and produce, including stock, in specified areas around given centres, appears to us to meet this necessity, and to be adapted to the conditions and ideas of Southern India, and we therefore advocate its adoption whenever and wherever it may be possible. As a beginning, the experimental farms already proposed would form convenient centres, especially as they will usually be at the head-quarters of a district or taluk, so that judging power and professional aid will be available. The Associations which we have also advocated, will, as they develop, provide not merely for an increased number of centres, but the funds, the judges, and, above all, the local stimulus which is more important than the prizes themselves.

54. Should it be determined to continue the system of prizes at shows, we consider that advantage might be taken of the customary and ancient festivals and cattle-fairs, with which the ryots of the surrounding country are familiar and to which they freely and voluntarily come for business and pleasure. No expense need be incurred for sheds, guards, &c.; the cattle would be already on view and in the care of their owners, and would be far more numerous than in the largest exhibition ever held or likely to be held under the auspices of Government. Advantage might also be taken of periodical markets for giving prizes to producers in order to encourage the production of superior grains, vegetables, and fruits.

55. As a further means of stimulating the cultivating classes, some power should be given to the department to propose special individuals to Government for the grant of slight honours and small rewards.

56. Finally we recommend that every feasible means should be adopted for disseminating successful results and useful facts or suggestions, whether by a Departmental journal, or by casual publications. We find that the results of experiments at Saidápet and elsewhere have not been disseminated in a popular form.

Question 9.—The course of study pursued at the College of Agriculture.

57. The courses of study in which instruction is now actually being given at the College are four, viz., that for the Preliminary and that for the Advanced (Diploma) group tests in Agriculture; Veterinary Surgery and Medicine; and that for the Preliminary group test in Forestry. It is proposed ere long to give instruction for the Advanced (Diploma) Group test in Veterinary Surgery and Medicine, but there is no intention of providing instruction for the Advanced (Diploma) group test in Forestry; in fact no regular teacher has as yet been appointed for teaching the single subject of Forestry for the Preliminary test, although instruction in the other branches of the group is given in the College. The subjects of the Preliminary tests are as noted in the margin.

Agriculture.—Agriculture (Preliminary: Botany (Preliminary, first stage): Inorganic Chemistry (Preliminary): Pure Mathematics (Preliminary, first stage): Mensuration: Animal Physiology (first stage): and Physiography.

Veterinary Surgery and Medicine.—Veterinary Surgery and Medicine (Preliminary): Inorganic Chemistry (Preliminary): Organic Chemistry (Preliminary): Animal Physiology (first stage): and Botany (Preliminary).

Forestry.—Forestry (Preliminary): Botany (Preliminary): Surveying and Levelling and Setting out (Preliminary): Physiography and Pure Mathematics (Preliminary, first stage).

The subjects of the Advanced tests are as follow:—

Agriculture.—Agriculture (Advanced): Economic Entomology (first stage): Inorganic Chemistry (Advanced): Organic Chemistry: Forestry (Preliminary): Animal Physiology (second stage): Veterinary Surgery and Medicine (Preliminary): Pure Mathematics (Preliminary, first stage): Statics (first stage): Kinetics, Hydraulics, and Pneumatics (Preliminary): Building Materials and Construction (Preliminary): Surveying, Levelling and Setting out (Preliminary).

Veterinary Surgery and Medicine.—Veterinary Surgery and Medicine (Advanced): Animal Physiology (second stage): Biology and Inorganic Chemistry (Advanced).

Forestry.—Forestry (Advanced): Horticulture (Preliminary): Economic Entomology: Geology (Preliminary): Pure Mathematics (Preliminary, second stage): Building Materials and Construction (Preliminary): Agriculture (Preliminary).

58. The examination in all the subjects admitting of it, is practical, as well as by papers and *vivâ-voce*. The nature of the practical examination is laid down in each syllabus; and great weight is attached to this branch of the examination in the Science, Art and Industries Notification of the 31st March 1886. It is prescribed as regard the science subjects that "no candidate shall pass in a science who does not satisfy the examiners in the practical side of the subject he elects." Again it is provided that "no candidate shall receive marks in any science, art or industry subject who, in the opinion of the examiners, fails to show such an understanding of the principles as is necessary for a useful practical application thereof." Further, it is provided that candidates must be prepared to draw good diagrams. We do not consider it necessary to give in each case, details of the provisions for the practical examinations, which will be found in the several syllabuses, but we draw attention to those in Agriculture. For the Preliminary test the practical side consists "of ploughing well with the improved plough and of an examination to thoroughly test the candidate's ability to use the ordinary farm implements and tools and his familiarity with farm matters generally." For the Advanced examination, the examination is to be on the same lines, but of a more searching character; each candidate has also to prepare an original essay on a considerable tract of country with which he is acquainted containing information regarding:—

(1) Its area, geological formation, soil, climate, water-supply, markets, &c.
(2) Agricultural operations in detail, yield, prices, &c., and the preparation of industrial crops, if any, for the market.
(3) Live-stock of area chosen, breed, condition, &c.
(4) General remarks.

59. The course of study for the Preliminary group test in Agriculture extends over ten months, beginning in September,—that for the Advanced Group test over

33 months, or virtually three years. No special period is fixed for the preliminary courses in Veterinary Surgery and Medicine and in Forestry; but we understand that an additional year's study is necessary to give a student a fair prospect of securing the Preliminary Group Certificate in either of these Branches. They are moreover practically subsidiary to the Preliminary course in Agriculture. We may therefore state broadly that one year's study is necessary for the Preliminary Agricultural Group Certificate, two years for the Preliminary Group Certificate in either Veterinary Surgery and Medicine or in Forestry, and three years for the Agricultural Diploma—a diploma which, as it now stands, has the merit of including with it the knowledge represented by the Preliminary Group Certificates in Veterinary Surgery and Medicine, and in Forestry. This fact we consider an important one and to be borne in mind in considering any proposals for curtailing the course in Agriculture.

60. Before proceeding to record our opinion on the suitability of the present course or courses prescribed for the College, and on the expediency of making any changes, and, if so, what changes, we think it desirable to call attention to the history of the existing courses.

61. In the curriculum of study originally sanctioned for the School of Agriculture on its establishment in 1875 instruction was provided in Agriculture, Zoology, Geology, Chemistry Inorganic, Chemistry Organic, Chemistry Agricultural, Veterinary Medicine and Anatomy, Botany, Horticulture, Drawing—Elementary, Plane, and Mechanical—Land Surveying and Mensuration, Mechanics and Farm Book-keeping. The course extended over three years. The students were expected to witness and take part in important field operations and in whatever work was going forward in the farm. There was no examination, written, oral or practical, of an independent character, nor were any tests of proficiency fixed, but an Agricultural Certificate was to be given at the conclusion of the course of training to each student who was found to possess the necessary knowledge and whose conduct had been satisfactory, certifying his qualifications as an agriculturist.

Vide G.Os., R.D., dated 24th November 1875, No. 1683; 18th May 1876, No. 642.

62. The School came formally, so far as internal control and some portion of the expenditure on the teaching staff were concerned, under the Education Department in 1880; and in 1881 some important changes were made in the rules, and also in the system of scholarships.* The institution was divided into Senior and Junior departments according to the system prevailing in the Medical and Engineering Colleges. Separate courses of study were laid down for each department. Some new subjects † were added to the Senior course; syllabuses were drawn up in all the important subjects: the practical work of the students was explained and regulated; and certain rules were laid down for the grant of College certificates and for special examinations. This code, modified in some important particulars, corresponds however in the main, the examinations excepted, with that finally sanctioned ‡ by Government in 1886. Its chief defect was that it provided for no independent Examining Board; this was, we understand, not then practicable.

* *Vide* Director of Public Instruction's letter, 5th August 1881, recorded in G.O., dated 8th August 1881, No. 256, Educational.

† Physical Geography.
Arithmetic.
Meteorology and Meteorological Instruments.
Rural Economy.
Revenue Regulations and Board's Standing Orders.
Hydrostatics.
Account Regulation.

‡ G.O., dated 25th August 1886, No. 546, Educational.

63. In 1884-85, the College, with a farm *annexe* finally passed under the control, financial and administrative, of the Educational Department, but the Veterinary branch remained under the divided control of the Agricultural and Educational Departments until February 1888, when the Veterinary Hospital was transferred with its establishment to Education.

64. The question of an independent examining agency was raised by the Director in his letter of the 3rd September 1884, recorded in G.O., dated 4th October 1884,

Mis. No. 620, Educational, in connection with his proposals for the development of scientific and technical education in this Presidency. The proposal was to entrust all examinations in furtherance of this object to the Commissioner for the U. C. S. Examinations. The examinations to be conducted under his orders embraced the final public tests of all technical institutions, among which were the College of Agriculture and the School of Arts. This technical scheme was developed and submitted in a tentative form to Government on 31st March 1885, together with draft syllabuses. It was shortly afterwards approved by Government and a committee was appointed to work out the details of the courses and the exact character of the syllabuses. The committee's recommendations and draft syllabuses were finally sanctioned in G.O., dated 31st March 1886, and the Science, Art and Industries Notification issued on the same date.

G.O., dated 3rd June 1885, No. 377.

65. We would remark here that it appears from the papers recorded in that Order that Messrs. Robertson, McNally, and Mills, who at that time were connected with the College of Agriculture, had an influential voice in the framing of the syllabuses connected with College, notably those in Chemistry, Agriculture, Animal Physiology, Veterinary Surgery and Medicine, Botany and Geology, Mr. Robertson having been a member of each sub-committee concerned. We would also here draw attention to a peculiar arrangement (the expediency of which has since been questioned in some quarters) adopted by the committee of bracketing portions of syllabuses, in subjects included in Group certificates, when the whole syllabus was considered too heavy for candidates coming up for the Group certificate. This arrangement, which has practically only affected the Agricultural College, was, we understand, considered by the committee preferable to a system of double syllabuses, but it is a question whether in several cases, it would not have been better to have adopted the double system.

66. We have already referred to the system of practical examinations in the subjects taught in the College. That system, no doubt, is still imperfect, and as matters stand, the thoroughness of the examination must depend partly on the subsidiary rules which the U. C. S. Commissioner may lay down for the conduct of this portion of the examinations, and partly upon the way in which the practical examination is carried out by the Board appointed in the several subjects. We observe that in the scheme of the Science, Art and Industries examination as originally proposed, it was provided that the full diploma in Agriculture should not be granted until the student had devoted, including his course at the College, five years to the study and practice of Agriculture; similar conditions were attached to other Branches. But we find from the final report of the committee that in the practical side of each syllabus, it was decided to omit the clause requiring competency or apprenticeship certificates from any outside authority, the tests having been modified to enable the examiners themselves to obtain from their own observation sufficient evidence of the candidate's competency to exercise his profession or trade. The circumstances of the country no doubt rendered it undesirable to weight the measure with conditions, which have only, so far as we are aware, been laid down in this Presidency for the students of the College of Engineering; even in that case no experience has as yet been gained of their working.

Vide papers recorded in G.O., dated 3rd June 1885, No. 377.

Vide papers recorded in G.O., dated 31st March 1886, No. 198, Educational.

67. Before passing to consider the desirability or necessity for making any changes in the existing courses, we would draw attention to the fact that the subjects for the courses proposed by the committee and sanctioned by Government for the College * were fewer than those provided in the revised curriculum of 1881-82. The number of the subjects has for reasons, which it is unnecessary here to detail, been further reduced under the operation of G.O., 16th March 1888, No. 164, and 23rd October 1888, No 603.

G.O., 25th Aug. 1885, No. 546, Educational.

68. The subjects of study in a curriculum must be regulated mainly by three considerations :—

(1) The work which the student is chiefly intended to perform on completion of the course :

(2) the time to be devoted to study :

(3) the standard of general knowledge with which a student begins his course.

69. As regards the first point, we consider that the work, which the *majority* of the students will, for some years at least, be called on to perform, will not be that of actual farmers, but of superintendents of experimental and demonstration farms, of Revenue servants, Foresters, Veterinarians, superintendents of estates, teachers of Agriculture and employés in miscellaneous callings connected more or less directly with Agriculture. The abstract in the margin will show that this has been the case in the past, and although we look forward, should our proposals in regard to Agricultural schools and experimental farms be approved, to the proportion of those engaged in the teaching and practice of Agriculture being very largely increased, we do not look forward to all the students of the College engaging in the direct exercise of Agriculture ; nor do we think it desirable that such a state of things should exist, as we are firmly convinced that the end in view,—the dissemination of higher scientific knowledge of Agriculture and of the sciences allied to it,—will be greatly furthered by leavening the Revenue, the Forest, the Veterinary, the Educational and other Departments and callings by men who have received a thorough course of instruction in this institution. We cannot too strongly press upon the Government that a College of Agriculture is absolutely essential for the progress of Agriculture, for the training of agricultural experts and teachers, and for the education of Veterinarians ; and that this institution is at present—the Medical College and, in some measure, the Engineering College excepted—the only important institution in the Presidency in which several sciences are taught in their direct application to the necessities of life. Nor would we have it forgotten that as yet hardly three years have elapsed since it has been working on the new lines, and that it has been so working at manifest disadvantage, as it has had but one instead of two scientific agriculturists trained in Europe on its staff.

Present occupations of Saidápet graduates.

Farming	39
Forests	29
Veterinary	25
Revenue, Salt and Agricultural Departments	80
Teachers	6
Miscellaneous	8

70. If our view of the men it should educate is correct, then we consider that it follows that there should be two departments in the Agricultural branch of the institution, in one of which men should be educated in Agriculture and its allied subjects, mainly with the view of becoming trained Agriculturists and superior teachers of Agriculture ; the other in which men should be educated to be teachers of Agriculture in elementary and, perhaps, in secondary schools ; for the special courses in Veterinary Surgery and Medicine, and also in Forestry ; for the various branches of the Revenue service ; and for callings to which an elementary knowledge of Agriculture and its allied subjects will prove a most useful auxiliary. For the Senior course we consider that a period of three years' study, that period embracing far more practical work than at present, is essential ; and for the Junior course that a period of one year should be allowed.

71. All experts agree in the opinion that the Senior course should be three years, notably Messrs. Robertson and Benson ; but Mr. Keess, the present Acting Principal, has suggested that the third year should be devoted almost exclusively to practical farm work. We are persuaded that from an educational point of view it is far better that the system which prevails in the teaching of Medicine, of Surgery, of Chemistry, and of many other sciences and arts should be followed, namely, that the theoretical and practical teaching should go hand in hand. Such a separation as that suggested would seriously injure the practical side of the Technical tests in the public examinations, whilst it is most desirable that that side should be developed and rendered much more effective than it now is. Nor are we aware that such a system has ever been tried. India is not a place to make new experiments in a matter of this kind. The proposal, too, seems to proceed on the assumption that one year's special field work will produce a practical farmer. We do not believe in such a result, nor do we at all

admit that this College can ever, without an expenditure utterly out of proportion to the value of the results likely to be secured, produce men of this description. They can only be the outcome of two sets of conditions separate or combined—either a long experience of practical Agriculture before the student joins the College, when he will be able, by the superior scientific instruction he there receives, to understand the reasons for or to correct the errors of his previous practice,—or by supplementing after he has left the College, the scientific instruction he has there received by considerable actual experience in the work of Agriculture under ordinary circumstances. If the scientific teaching of the College were based on previous practical knowledge, and supplemented by further practical experience, the result should be all that could be desired.

72. The last consideration is the standard of general knowledge which a student has attained before entering the College. In this connection we would draw attention to the proposals of the Director of Public Instruction, included in his letter recorded in G.O., No. 194, dated 16th February 1885 (para. 167, Appendix C); we entirely endorse the proposal relating to the qualification of candidates for the Senior course, viz., that of the F.A. Examination, and trust that it may be possible ultimately to work up to that standard. But owing to various causes not necessary to detail here, the College will, for some years to come, probably be mainly recruited from men having a lower standard of education. In any case, however, we consider that at least three years are necessary to bring them to a high standard of knowledge in the various branches of the examination, for we do not believe that students can be brought to a fairly high or adequate standard of knowledge in such subjects as Inorganic Chemistry, Organic Chemistry, or Animal Physiology,—leave alone Agriculture,—in less time. The result of shortening the course would be a tendency to lower the standard fixed by the Technical committee. We do not purpose giving an opinion here as to whether these standards are in every case exactly what they should be: but we record an emphatic protest against the introduction of such changes as would lead to the grant of a diploma to a student whose knowledge is of a standard which would bring the certificate into contempt. If the students of this College, in its higher branches, are to take a proper position amongst the science graduates of the Presidency, their knowledge must be of a high order. The Hindu has a reverence for high attainments in learning or science, and one of the best ways of impressing his mind in the matter of scientific Agriculture is to ensure that the men who hold the diploma in Agriculture, can hold their own with the alumni of the University. Four years are required for the Licentiate Degree in Medicine; the students for this degree are ordinarily Matriculates. The results of the examination show that that course is far from being too long. We cannot then naturally expect that men of the same general educational attainments can gain an advanced or even sound knowledge of the subjects included in the Agricultural Group tests in a shorter period than three years.

73. As regards the Junior course which is intended expressly for Primary and Secondary teachers, for Veterinary and Forest students, and Revenue employés, &c., we recommend that the minimum general educational qualification should be a pass in the Middle School Examination, or in the Special Primary Examination supplemented by a pass in the Agricultural Branch of the Middle School Examination.

74. Passing to the subjects included in the Senior course in Agriculture we would premise that we do not consider that a committee, constituted as this is, can appropriately advise the Government as to the exact standard of knowledge which should be demanded in each subject. That function must be left to a committee of experts. All we feel called on to do is to record our opinion generally on the suggestions which have been made by Mr. Keess; proposals which in most cases have not Mr. Benson's support, whilst they are greatly at variance with Mr. Robertson's programme, upon which the committee fixed its courses and the standards. The proposals of Mr. Keess, however, were made with special reference to a two-years' theoretical course, and although in examination he said he would still exclude the subjects noted by him with a three-years' course, we consider that a three-years' course, even with far more time than at present given to practical work on the farm, admits of a larger number of subjects being taught than Mr. Keess proposes.

75. His proposal is to omit the subjects noted in the margin. We do not consider it advisable at present to omit Mathematics, more especially as the test has been reduced to the first stage in the Preliminary Examination comprising Arithmetic, Geometry, and Algebra. We believe that until the general educational standard of students entering the college can be raised, the knowledge in Mathematics of ordinary candidates is not at all adequate to the intelligent study of several of the important subjects of the group, notably Surveying and Levelling. That such students are not fit, so far as Mathematics is concerned, for this and other courses, is proved by the great labor required to prepare for this comparatively simple test. Of course it would be better if the students passed in the subject before admission; but it is not at present possible to lay down a rule that this examination must be passed before admission. Possibly the test might be simplified, but in regard to this we consider that the opinion of specialists must be sought. If, as we have recommended, the F.A. standard be adopted for admission, this test would become superfluous.

1. Mathematics.
2. Mensuration.
3. Building Materials and Construction.
4. Forestry.
5. Statics, Kinetics.

76. As regards "Mensuration," we are disposed to think that the syllabus might be recast on less advanced lines. Mensuration is taught in Primary schools and is a subject of the Primary Examination and of the Middle School Examination. It is manifestly undesirable in an institution, many of whose students will become subordinate Revenue officials, that the subject should not be taught in the Junior department; and we see no valid reason for excluding it from the Senior.

77. We are not in favor of continuing Building Materials and Construction as a subject of study. We believe that it is an ordinary subject in Agricultural schools in other countries, and we admit that it is desirable that a farmer, or one who has to supervise a farm, or a forester, or a revenue servant should have an elementary knowledge of the subject, but we think that, in the conditions of India, it will suffice if it be retained as an optional subject.

78. Forestry, we are of opinion, should be taught as part of the Agricultural course up to the standard of the Preliminary examination, because we consider it a decided advantage that men who have the Agricultural Diploma should have an elementary knowledge of the subject. In many parts of this Presidency the ryots are deeply interested in forest administration. If the men who are to influence their opinion know little of the subject, they are not likely to be wise or prudent advisers. We doubt much whether the inclusion of the subject in a very brief form in the Agricultural syllabus, as proposed by Mr. Benson, would be any adequate substitute for its study in a more complete form.

79. As regards Statics, Kinetics and Hydraulics, we consider that these subjects ought to form part of the course of study. In this Presidency agriculture depends so much on hydraulic agencies, that a sound elementary knowledge of the subject is unquestionably desirable, if not necessary, not only for practical agriculturists, but for many persons, officials and others. It may be that the standard is too high; and on this point we think the U.C.S. Commissioner might be instructed to consult a committee of specialists, but we are wholly opposed in this, as in Forestry, to reducing the standard of knowledge very low, or to including the subject in the Agricultural syllabus. We consider that the general scheme of the Technical examinations should not be disturbed for a special institution if such a course can be avoided.

80. Passing to the Junior course,—Mr. Keess has recommended that Mensuration, Physiography, and Mathematics should be excluded from the Preliminary Group Test. We do not concur in his views as a whole, but we think it unnecessary to insist on Mathematics. The time is too short for a backward student to make any marked progress in Mathematics without sacrificing special subjects. Besides, Surveying is not included in the Preliminary Group Test. We have already expressed our opinion in favor of the retention of Mensuration in the Junior course, and for it, no doubt, Mathematics is desirable, but we have also suggested that the test should be simplified. Physiography cannot be omitted without manifest loss. The teaching of

Physiography as a method of making a native student acquainted generally with the chief physical phenomena of the surface of the globe is unequalled, and the course would lack in completeness and in unity if the subject were omitted.

81. As regards *Veterinary Medicine and Surgery*, we are unanimously of opinion that this subject should not only be taught in an elementary way to Agricultural students, but that a separate branch should be instituted in the college for the training of Veterinarians of the two grades represented by the Preliminary and the Advanced Group Tests in Veterinary Surgery and Medicine, and that this branch should, if possible, be under the control of a Veterinary Surgeon educated in Europe. The Veterinary Hospital is still small, and its operations as regards both in- and out- patients but limited, but we see no reason to doubt that operations may gradually be so extended as to provide adequate practical instruction for students for the Advanced as well as for the Preliminary Examination. No doubt the demand for Veterinarians is, at present, almost wholly confined to the Cattle Disease Department, but the limited character of the demand is possibly in part due to the fact that men trained under the old system were anything but efficient, and were especially defective in practical knowledge. The provision of a sound system of education in connection with the Technical tests in this subject should remove this hindrance, whilst the demand of the Cattle Disease Department should suffice to induce a few young men to join this branch each year. When a good school has once been established, it is quite possible that Municipal and Local Boards will employ them readily as Sanitary Inspectors, and that Native States will take advantage of it. In any case we consider that the needs of the Cattle Disease Department justify the making of special provision for instruction of a fairly high order at Saidápet, and we consider that this Presidency should not be left to rely on Bombay or elsewhere for the education of the Veterinarians it needs.

82. The courses of study for the Junior as well as the Senior course were prepared mainly by Mr. Mills and seem to us suitable; but if they need amendment, such amendment can easily be carried out by means of a committee of experts. The results, however, of at least one examination should be awaited before any action is taken in this direction.

83. The course of study for the Preliminary Group Examination should extend over two years, and that for the Advanced Group Test, over at least three years. In the case of candidates for scholarships or for employment in the Cattle Disease Department, we consider that the passing of the Preliminary Group Test in Agriculture should also be a condition of securing the one, or of entering the other.

84. As regards the general educational qualifications of candidates for beginning the course, we consider that, for the Senior course, candidates should ordinarily have passed the F.A. Examination for the University, and for the Junior course, a test qualifying for superior Government service, except in the case of paying students who may be admitted if they have passed the Middle School Examination.

85. We consider that, if scholarships are provided from Provincial funds, they should be few in number, but of fairly high value, that they should be given for specific objects and on defined conditions, and lastly, that the scholarship-holders should serve as demonstrators, and be, from time to time, sent on tour with the Inspector of Cattle Diseases.

86. The Government are aware that the efficiency of the present Stock Inspectors is unequal. To secure efficiency, we are of opinion that no present Stock Inspector should receive a permanent increase in pay until he has passed the Preliminary Group Test in Veterinary Medicine and Surgery. If he is unable to appear for this test without further instruction, he should be sent for any period not exceeding 10 months, on half-pay, to the College to be trained for that test.

87. As regards men to be admitted to the Department hereafter, we would lay down as a rule that no Stock Inspector shall be appointed unless he has passed the Preliminary Group Test in Veterinary Surgery and Medicine, and that no Inspector once appointed shall be permanently promoted to a salary exceeding Rs. 100 monthly until he has obtained the Veterinarian's Diploma. Such restrictions would probably in the course of a few years secure for the Department a body of really efficient servants.

88. As regards *Forestry*, we are of opinion that the subject should, for the benefit of the Agricultural students, as well as for the convenience of the Forest Department, be taught at Saidápet up to the standard of the Preliminary Group Certificate in that subject, and that the staff should be strengthened by a man who, in addition to the Agricultural Diploma, holds a good certificate from the Dehra Dún School. By such an arrangement, the teaching of the subject should involve no extra expense.

89. Saidápet is not so badly situated for a Forest class as at first sight may appear, for although there are no forests in the immediate neighbourhood, there are large casuarina plantations all round Madras, whilst in the plantations in its neighbourhood on the old Government Farm, practical instruction could be given not only in such subjects as the felling, seasoning, measurement of timber and of fuel, and management of depôts, firewood, faggots and charcoal-making, but in the management of avenues, topes, nurseries, sowing and planting, pruning, hedges—all subjects of the Preliminary Examination in Forestry.

90. Further, at no great distance from Madras, in the North Arcot, Cuddapah and Nellore Districts, the students might, during short tours with the Assistant, learn much of the system of management of large forests.

91. Instruction in Forestry seems to have brought the College into somewhat close connection with the Forest Department.. That Department is already indenting on the College for its Foresters and Forest Rangers, whilst a few of its ex-students have risen to the position of Sub-Assistant Conservator, and we think it would be a mistake if increased facilities were not afforded for making the institution more and more serviceable to that Department, and a means of preparing students for the higher course of training at Dehra Dún. If the exclusion of Forestry endangered this relation, it would be an undoubted injury to the College and probably an appreciable loss to the Forest Department.

92. We have, in paragraph 78 *supra*, stated the advantage, we believe agriculturists derive from the study of Forestry, and we would reiterate that statement here.

93. We consider, subject to the above remarks, the course of study laid down for the College good, but to make it produce really satisfactory results we are strongly of opinion that no time should be lost in thoroughly organizing practical instruction in agriculture by means of the farm annexed to the College, and for working out in detail the idea for the conduct of this branch, which we believe was entertained when the College began to work under the new scheme, but which for various reasons unnecessary to detail here, has not yet been given full effect to. The proposals for working the farm on these lines are to be found in Mr. Robertson's letter recorded in G.O., 8th January 1886, No. 17, Edl. These proposals were approved by Government and sanctioned. So far as they go, they are good, in that they proceed on the lines that the student should, as far as possible, be shown in the field what he learns in the lecture-room,—but they are in our opinion defective in that (1) they do not map out more distinctly what should be demonstrated, (2) how such demonstration should be effected, (3) what part the student should take in the demonstration and (4) what practical knowledge he should actually acquire to qualify himself for passing the practical tests in Agriculture for the Preliminary and for the Advanced test.

94. As to the first head—we consider that a student during his course should watch attentively the actual cultivation, on superior methods if known, so far as the College farm, climate and soil admit of this being done, of the chief grain, edible leaf, and fruit-bearing plants of the Presidency, and of as many exotics as can be cultivated there experimentally or otherwise; he should similarly be taught the uses of implements, new and indigenous, and be shown their merits and defects; he should be taught to observe the methods of harvesting crops, the means of preserving seed, &c.; in short he should have before him continually a varied system of agriculture and horticulture, carried on on ordinary as well as on improved methods, and should be taught how to make experiments and how to record the results of the experiments.

95. As regards the second head—we consider that the present system of cultivating the farm with large fields and a few products, should be abandoned except in so far as this may be necessary to illustrate the uses of certain farm implements and to give the students an idea of managing large field areas for particular crops; we

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would divide the farm into several sections containing numerous small plots, each plot having representative cultivation in it, and each section being regarded for educational purposes as a separate farm.

96. As regards the third head—we would divide the students during the first and second year into batches, and assign to each batch a small section. A programme of cultivation for each year should be laid down by the Principal, and the students should be responsible for the cultivation, be required to take an active part in it, and to record the operations carefully. We would give to each batch a pecuniary interest in the proceeds of their cultivation; we would lay down precisely the minimum number of hours in the week each student should work in his plot. To the third year students, we would assign individually separate plots or sections. We would not prohibit the use of hired labor by students, subject to defined rules. This batch and individual cultivation system should not supersede the present system of itineration through the farm with the Professor and Assistant Professors of Agriculture, but should simply supplement it. Each student should carry out, or see carried out, a complete three-shift course; details to be periodically settled in communication with the Director of Agriculture. In order to widen the ideas of the students by experience outside of the Farm, we would suggest that the senior students should be taken out for tours of observation.

97. As regards the fourth head—we are of opinion that the practical side of the agricultural syllabus should be amplified by an explicit statement of the operations, &c., which an examinee should be required to perform, and we would provide that such examination shall, if necessary, extend over several days and be held at different periods of the year, and deal searchingly and fully with all the practical knowledge an agriculturist should possess. The requirements for the preliminary examination should be very moderate. We believe that if the farm *annexe* of the College is organized in the way we suggest there should be no difficulty in ascertaining satisfactorily the practical attainments of each student, and we are persuaded that, without some such system, the practical side of the examination in Agriculture will fall far short of what it should be.

Question 10.—The class of students at the College and the conditions under which they come to it.

98. Looking at the 282 students of the College according to social classes, we find that including the present students, the distribution is as follows:—

Europeans, Eurasians and Native Christians	29
Muhammadans	15
Brahmins	156
Sudras and others	64
Parsees	18

Taking, however, the distribution of students at the end of 1887-88, we find that of 76 students, 46 were Brahmins, 20 Sudras and others, 9 European and Eurasians, 1 Muhammadan. This distribution shows that the relative proportion of Brahmins, Sudras and others is increasing. We know that a very great majority of the students, possibly 90 per cent., are either land-holders, or belong to land-holding families, the holdings being chiefly small. That this should be so is but a natural inference from the condition of the schools of the Presidency, four-fifths of the pupils of which probably are sons of people holding or cultivating land whilst nearly one-half were actually returned as children of land-holders, in the statistics of 1887-88. The figures already given regarding the employment of ex-students, as well as the known condition and aspirations of Indian students tend to show what is no doubt the fact, that many, probably the large majority, of those who join the school have not the profession of farming as the end in view in going through a course of study in the College, but the qualifying of themselves for appointments under Government in callings for which they believe, and believe rightly, that a knowledge of agriculture and of the allied subjects will render them more eligible. But the history of the past, and the attitude of mind of the existing students, prove that some at least desire special knowledge with the object of utilizing it directly in agriculture, either as farmers or otherwise. That many students should go through the course with ulterior objects other

$\frac{192,716}{404,191}$

than agriculture, is not, we consider, to be regretted, provided there is room for such students, and that a fair proportion have as their object in life the profession of agriculture, and are likely more and more as the country advances to make use of that knowledge. Special care is, however, taken not to admit to a scholarship at the College any student who does not belong to a family holding land.

99. We regret that as yet but few sons of large land-holders have come to the College, but we are disposed to think that with the growing feeling among the educated classes in favour of knowledge of a more practical character, with the growth of intelligent interest in agriculture among these classes, and with the modelling of the Agricultural course on more practical lines, some, perhaps material, improvement is to be expected in this direction.

100. Passing to the "conditions on which students come to the College," we understand the Government to refer to the rules relating to the admission of students, paying, free, or stipendiary, but especially to those provisions, under which a Collector may select a person already in the Government service, and send him, if eligible for leave, on half-pay, if not, without pay, for instruction in Agriculture at the College, the period so spent being counted as service; or may select a person eligible for Government service and send him to the College "on the understanding that he shall be provided with suitable employment in the Revenue branch of the service on the satisfactory completion of the course." Students sent under these conditions are allowed scholarships rising from Rs. 10 to 15 for the Senior department; Rs. 7-8-0 is fixed in the case of the Junior department.

101. We consider that the object in view in establishing these scholarships was good, but that the system has failed to produce much effect, partly because the transfer of Jungle Conservancy to the Forest Department decreased the number of suitable appointments, and partly because a system similar to that prevailing in the Education Department of appointing a master *sub. pro tem.* and then sending him to be trained for a year at the Teachers College, his confirmation depending upon his successful training, has not been adopted; moreover the validity of the contention that—other things being equal—men trained in the College, would after some actual experience, which is necessary in all callings, in the actual duties of their office, be likely to prove more efficient public servants than those not so trained, has not been duly appreciated. We especially refer to Revenue Inspectors and other subordinate Revenue officials holding posts leading up to Deputy Tahsildarships, and Tahsildarships. We are of opinion. other things being equal, that a Revenue Inspector, who has been trained in the College of Agriculture, is more likely to report intelligently on the extent, condition, description, and outturn of crops, on simple questions connected with minor irrigation works, or with petty estimates for repairs, or regarding survey-demarcation, or connected with the health of cattle, than a man whose only qualifications are the experience of a petty Taluk Gumastah. And if a Revenue Inspector is rendered more fit, so should a higher Revenue official become more fit, other qualifications being equal. We do not hold that it is desirable or necessary that all Revenue subordinates should have this special knowledge and training, and we do not for a moment undervalue the advantages accruing from the possession of superior general education, but at the same time we are decidedly of opinion that special knowledge of the kind included in the Agricultural courses would be of great advantage to the service of Government in the Revenue Department, and if such special knowledge is valuable, it is manifestly likely to be more valuable, if it has been obtained practically in an institution set apart for such instruction, than if obtained cramwise through text-books with or without the help of a teacher.

102. In making these remarks we wish to guard ourselves from being thought to recommend that all parts of the Presidency should be treated similarly. Far otherwise; but we consider that a beginning should be made in this direction in the Southern and other Tamil districts, by requiring, after a certain date, say three years from date of notification, the Preliminary Group Certificate in Agriculture from all candidates for the office of Revenue Inspector. We understand that at no distant date instruction will probably be provided in one or two of the districts concerned in the subjects of this test, in connection with the District Normal schools, so that candidates in the South will not necessarily be put to the expense and trouble of a journey

to and residence at Saidápet. If such a condition were imposed it would not be necessary to retain the District Scholarship system, as candidates would probably be readily forthcoming; but we see no objection to retaining the power allowed to Collectors to send Revenue servants, or persons eligible for Revenue service, to the College for training; and we would also confer on them a power similar to that possessed by the Director of Public Instruction under the Teachers' College Rules, of appointing men *sub. pro tem.* to Revenue posts and sending them on half-pay to be trained. We consider it to the advantage of the Revenue Administration, an advantage which will become more and more apparent if the High School scheme is sanctioned, that the Collectors of districts should possess a voice in deciding who the majority of the students of the College shall be. They clearly are more likely, when they once recognise the position which the Government intend the College to occupy in the country, to provide suitable men for training than is the Educational Department. Again, if, as we hope, district Agricultural classes gradually grow up, the knowledge that the Collector has the power to nominate to the College, will certainly prove helpful.

103. We have no intention that such students should be non-paying; they should pay as the students of the Engineering College pay, although the latter are selected by open competition. In case of the establishment of any stipendiary scholarships, they should be devoted to specific objects such as the training of agricultural teachers and the enabling of *bonâ fide* agricultural pupils and elementary teachers from mofussil agricultural schools and classes, to pursue their studies in the College or at Government farms.

Question 11.—Whether the students engage in Agriculture after leaving the College.

104. We have already noted in paragraph 69 the number of students who have passed out of the College, who are directly engaged in Agriculture, and that number is very small. This we admit is an evil, but we believe it to be an evil which will cure itself. If the course of study and of practice becomes as thorough (as it bids fair to do) as it should be, then the aptitude of the students for Agriculture will be greater than at present, and their disinclination to become practical Agriculturists less. Again, as the number of ex-students becomes large they will cease to find employment in the Public service as easily as they now do, and necessity will drive them to farming. Again, as the teaching of Agriculture spreads through the country, as it unquestionably will do, if the subject is duly recognised by Government for its service, and encouraged by the Educational Department, not a few teachers will engage in Agriculture in connection with their theoretical teaching. Lastly, as most of the students are of the landholding class, we cannot doubt that they will probably bring their knowledge to bear on the cultivation of their family estates, whatever their actual employments may be. For example, an Agriculturist who becomes a vakil will not be a worse vakil because he has the knowledge how to develop or manage his estates on more scientific principles, than they have heretofore been managed. Except in the case of stipendiary students we would deprecate any attempt to bind students to the exercise of their profession, should such a suggestion be made, in the same way as we would deprecate any proposal to bind a Medical, Engineering, or Art student to exercise his.

105. Though the number of passed students who are directly engaged in agriculture is, as we have said, very small, we are still of opinion that the College has given a fair return to the country for the money spent upon it. The time it has existed, the attention it has excited throughout India, and the undoubted good that it has done, imperatively demand its continuance.

Question 12.—Whether the College ought to remain under the Director of Public Instruction.

106. We are, in existing circumstances, unanimously in favour of the institution remaining under the Director of Public Instruction, because we see no adequate reason for treating it differently from other technical institutions, which appear to have benefited by their separation from the Departments with which they are directly concerned; because we consider that the authority that must from the very necessity of the case, control instruction in Agriculture in the secondary or primary schools should also control it in advanced schools, if unity of purpose and continuity of policy are to prevail; because the work

even on its practical side is essentially educational and therefore the probabilities are that it will be more judiciously directed by the head of the Educational Department assisted by the specialist Principal than by an officer whose experience must have been mainly that of Revenue administration ; because it is intended to utilize the institution for the special training of Normal teachers of agriculture ; because in this connection it must be worked in intimate relation with the Teachers' College ; and lastly, because there is the danger of its staff and laboratory being utilized in non-educational matters to the manifest detriment of educational work.

107. Possibly, if the Government created an Agricultural Department wholly separate from the Revenue Administration, a change in the control might be desirable,—but as the creation of such a Department is not likely to be effected, we consider it unnecessary to discuss the question, because its solution would depend entirely upon the functions of that Department, and these have yet to be settled even in outline. We consider, however, that the Director of Agriculture should be consulted by the Director of Public Instruction in all important matters connected with the farm annexed to the College, and that that officer should annually report to Government through the Director of Public Instruction, on the working of the farm.

108. *Suggestions.*—We have now answered the questions relating to education put by the Government, but we feel that we must deal with the question of education with special reference to the needs of the Agricultural community. We are persuaded that no means of increasing the efficiency of the Agricultural Department can be really effective, so far as efficiency depends upon the intelligent co-operation of the people, unless the people are taught to understand what is defective in their present system of agriculture, where it is capable of improvement, and the best means for that end. We believe that this can only be done first by extending their general education, *i.e.*, by teaching them not only to read, write and cipher, but to use their knowledge so that, they may, in however humble a manner, become thinkers, observers, experimenters. Routine is the rock, on which every effort to improve the ryot's practice, to extend his powers over nature, and to add to his knowledge, splits. His knowledge is small, but he has no means of adding to it ; his experience is narrow, but he does not enlarge it ; his practice is defective, but he does not know how to improve it. It has been said, if the ryot can be shown wherein his practice is bad he will abandon it for a better ; if he is shown how he can add to his wealth by growing new products, or old products of better kinds he will accept the advice. But universal experience goes to show that the peasant in all countries has a strong natural tendency to stick to the bad because it is old, and to refuse to adopt the good because it is new. Unless the intelligence of the cultivator be developed, and developed in such a direction as to lead him to devote a better trained intelligence to his own art, and to apply thought, observation, and experiment to matters which concern his material well-being, we believe, that progress, if not absolutely impossible, must be so slow as to effect little appreciable change in a generation. We assume, as an axiom, that the wealth of this country may be enormously increased by improved methods of cultivation, by the introduction of new products, and by the rational treatment and development of stock. Education is the mightiest lever that can be applied, however great and beneficial the influence on the intelligence of the people of railways, roads, canals, good markets, and good ports and outlets for produce may be ; these are necessary and helpful to agriculture as educators but they must fail to produce the greatest material progress possible, and secure that progress when attained, if the people remain ignorant and wedded to bad and, often, injurious methods.

109. The first requisite for the dissemination of agricultural knowledge is, we need hardly say, the extension of higher, secondary and primary education amongst the land-holding class. At present the distribution of education among this class, viewed in proportion to its extension among other classes, is fairly satisfactory, being, however, least satisfactory in the secondary grade,—but absolutely it is of course still very far from satisfactory—and we would deprecate any large expenditure for the dissemination of any special branch of knowledge, such as agriculture, if we did not believe that by extending this special knowledge, the progress of general knowledge, although necessarily antecedent to it, will be more rapid than would be the case if general knowledge remained connected solely with the arts of reading, writing and

ciphering, arts which however necessary for the intelligent exercise of any art, are not at present much appreciated by the cultivator and are forgotten soon after school-life ceases, unless they are taught as hand-maids to his own peculiar art—agriculture —the art of nine-tenths of the population of the Presidency.

110. Agriculture is now an optional subject in standards IV, V, VI and VII. The text-book to be used in standards IV and V has not been issued, but will shortly be so. It remains to be seen whether it is quite suitable to these standards. From what we have heard regarding it, we are disposed to think that it will be more suitable for the V and VI standards. Mr. Robertson's Agricultural Class-book is now prescribed for the V and VI standards. If the new text-book is prescribed for the V and VI standards, Mr. Robertson's book should be reserved for the VII standard. In this standard, which falls within the operation of the Middle School Notification, the book work is supplemented by a practical examination. In the other standards there is no practical side, but the subject is examined in *vivâ voce*, so that there is ample scope for an intelligent and competent examining agency compelling the subject to be taught, as it should be taught, with illustration from and in the field.

111. In the High School curriculum the subject does not find a place, because it is not recognized by the University for the Entrance Examination, but should the proposed High School examination be approved by Government, it will then find its proper place among the optional branches prescribed for Government service, and will, we do not doubt, soon receive the share of attention in High Schools which it deserves.

112. As regards the examinations qualifying for the public service, we observe that Agriculture is included in the new Primary Examination; in the Special Primary Examination (the lowest general test for Primary teachers); in the Middle School Examination; and in the proposed High School Examination as a branch of the Technical Examinations. In all these examinations it appears as an optional subject.

Government Notification, 29th January 1889.

113. It will then appear that outside the University the subject is provided for; and, if the provisions were fully utilised, the effect in the country from directing the mind of the rising generation to the subject, and in enabling it to view it naturally and intelligently, should ultimately be considerable. Unfortunately hitherto little has been done in this way, and that little has been done almost wholly through the agency of the Agricultural College. It is true that 226 boys passed in Agriculture in 1887-88 under the standards noted in the margin, which probably implies that about 500 boys appeared for examination in the subject, but as the examining agency had no special knowledge, and few of the teachers could have been taught the subject intelligently, the influence represented by these figures on the country is not much; still it is good so far as it goes and shows that a good deal may be done through the optional system when suitable teaching is provided, and an adequate stimulus afforded.

Standard IV	5
Do. V	157
Do. VI	19
Do. VII	2
Special Primary	43
Total ..	226

114. The first point to be considered is, is the subject included in a sufficient number of standards? If it is to be extended it must be downwards, but we are not in favor of including the subject in any standard below the IV; because we believe that the general knowledge of the children as represented now by that standard is not sufficient to warrant Agriculture being taught as a special subject even in the III standard. We are of opinion that the subject is adequately provided for in the infant and first three standards under "object lessons in elementary science," as that head is intended to provide a progressive course from standard to standard, of simple lessons on familiar animals, plants, and substances, "calculated to cultivate habits of exact observation, statement and reasoning." An intelligent teacher of this course would naturally in rural schools adapt his lessons to what the children see around them; in fact this is now the rule, as the favourite subjects for object lessons are the cocoanut tree, paddy, plantains, soil, salt, &c.

115. The second point is whether the agricultural course and the tests in the subject in the several standards and several public examinations are what they should be.

116. Beginning from the lowest standard, viz., the IV, we are of opinion that the course here should comprise the inculcation in a simple form of the great principles of the healthy growth of plants, and of sound methods of cultivation,—the subject to be taught not only from a text-book, but orally by a teacher who understands the subject in its practical and theoretical aspects; though his standard of knowledge of details need not be high, he should have a thorough grasp of the subject so far as he has gone and have been taught how to impart what he knows. In view of the above remarks we consider that a text-book,—a catechetical form is probably the best—should be prepared in English—to be translated into all the South Indian vernaculars. Its illustrations should all be drawn from South Indian Agriculture—so far as the facts are common to all parts of the Presidency. We doubt much whether it is possible or desirable at this early stage to have text-books with local illustrations only. There is enough in common throughout the agriculture of the Presidency to render localization in this respect unnecessary, except in so far as oral teaching is concerned.

117. For the IV and V standards the book about to be produced should probably suffice—but we would make it a condition of a pass—that the pupil should in the *vivâ voce* examination show an intelligent understanding of the facts of the text as applied to local agriculture—similar to the requirements of the Middle School test in Agriculture. We consider that the present test is sufficient as a test for ordinary scholars, but as a test for teachers of the Primary Grade we think it should be supplemented by requiring some knowledge of local agriculture and of agricultural practice to be tested in an oral examination by competent examiners.

118. We have already recorded our views regarding the Technical examinations in Agriculture. We would add, however, that for the teaching of Agriculture for the Preliminary Group Examination, a small demonstration farm or plot must be available for the students.

119. The remaining test is that for the Special Primary Examination. The examination is wholly written and the subject of examination is agriculture as described in Robertson's Agricultural Class Book. This is the text book for the Middle School Examination and is quite unsuited for men of the class of village teachers, who appear for the Special Primary examination. In lieu of Robertson's book the book about to be issued may probably be with advantage prescribed for teachers only; the book-work examination should be expanded by an oral examination on the facts, on the same lines,—but simpler—as the present oral test in the Middle School Examination; we would not, however, expand the test further in the way noted under the Middle School Examination even for teachers.

120. The third point for consideration is the supply of teachers. In dealing with this subject we proceed on the assumption that though optional, it is to be taught more and more generally in the Primary and in Secondary schools in view of the requirements of the Public Service, and that the subject shall in certain cases be taught in special institutions, not only theoretically and with school-room demonstration, but also as an art in the field, the latter method being especially intended for the provision of competent teachers of the several grades.

121. Three grades of teachers appear to us necessary, the two lower grades being each sub-divided into higher and lower. *The highest or Diploma Grade*, should include teachers who are capable of teaching Agriculture and its allied subjects, theoretically and practically, for the Advanced group test in the Technical Notification. To qualify for this grade a teacher should have—

(1) the diploma in Agriculture;
(2) a certificate of having been trained in the Teachers' College;
(3) a certificate of having satisfied a Board of Examiners of his capabilities as a teacher of Agriculture and the allied subjects;
(4) a certificate of having engaged in practical Agriculture for two years after obtaining his diploma.

The *Secondary Grade Higher* should include teachers capable of teaching Agriculture with demonstrations for the Preliminary Group Certificate in Agriculture, and of managing a small demonstration farm or garden at a secondary school or at an elementary Agricultural school or class. The qualifications should be—

(*a*) the diploma in Agriculture;
(*b*) an ordinary teacher's certificate;
(*c*) a certificate of having satisfied a Board of Examiners of his ability to teach Agriculture only, and to manage a small demonstration farm.

The *Secondary Grade Lower* should include teachers capable of teaching the subject of Agriculture theoretically, and with ordinary lecture-room demonstration.

The qualification should be—

(*a*) the diploma in Agriculture;
(*b*) an ordinary teacher's certificate.

The *Primary Grade Higher* should include teachers capable of teaching, in Middle and large Primary schools, the subject theoretically and with ordinary demonstration up to the standard of the Middle School Examination in Agriculture.

The qualification should be—

(*a*) the certificate of having obtained the Preliminary Group Certificate in Agriculture;
(*b*) an ordinary teacher's certificate.

The *Primary Grade Lower* should include teachers capable of teaching the subject, as it appears in Standards IV, V and VI and in the Special Primary Examination.

The qualification should be—

(*a*) a certificate of having passed the Middle School test in Agriculture, or, when especially accepted by the Director of Public Instruction, a certificate of having passed the Special Primary examination in this subject;
(*b*) a certificate of having been trained in a Normal school; or of having obtained an ordinary teacher's certificate.

122. It will be observed that all teachers of the first two grades must have passed through the Agricultural College; as things now stand we consider this condition essential. The time may come when some agricultural schools or classes in the Districts may be able to pass students in the Preliminary Higher Examination in Agriculture, but that time is, we consider, still distant, unless the High School Examination gives adequate impetus to the study of the subject. To induce ordinary teachers to qualify, special Scholarships will no doubt have to be granted, and full advantage taken of the Grant-in-Aid Code, which provides special help for persons sent for training as technical teachers. The Victoria Technical Institute, recognizing the primary importance of providing efficient teachers before any general beneficial result can be achieved, is now offering special scholarships to enable teachers to qualify in special Branches, of which Agriculture is one. The one year's course at Saidápet is suitable for such cases, but we believe, if the demand for agricultural instruction grows, that not a few of those that obtain the Preliminary Higher Group Certificate will, by private study, and practice as class teachers, qualify ultimately for the diploma.

123. The fourth point is the provision of qualified teachers for primary rural schools.

124. This provision can only in our opinion be made very gradually, but we see no reason to doubt that if the policy of encouraging the study of agriculture as an optional subject in village schools, more especially in connection with the new Primary Examination, is pursued steadily for a few years, and increased attention is paid to the training of efficient teachers, as the chief want in rural primary schools, marked progress will be made. We have only to point to the rapid extension of teaching Hygiene since this subject has been regularly taught in elementary Normal schools, especially those for girls, in support of our view. We know the subject is much more difficult, but on the other hand it is one in which the people will take far more interest than they do in Hygiene. No man can close his ears to or view with indifference knowledge applied to that subject of all others which occupies his thoughts most fully. As regards perhaps five-sixths of the parents of our school boys this

subject is agriculture. But optional the subject should remain, except in so far as the Managers of schools, a term which it is to be remembered includes Local Boards, declare it compulsory.

125. The Agency we propose for providing suitable teachers is the District Normal school, supplemented in certain districts, by district experimental farms. The latter, however desirable, is not, we consider, at all events at the first beginning essential for the success of the measure.

126. We consider that the subject should be taught as an optional or compulsory subject, as the District Board may decide, in all District Normal schools, with the view of passing the Normal students concerned in the first instance for the subject of Agriculture in the Primary Examination, or in the Special Primary Examination according to the capacity of the student. In advanced districts there probably will be no great difficulty in bringing the majority of the students up to the standard in Agriculture proposed for the Special Primary Examination. Such students as pass that examination should be retained for a second year and allowed scholarships for that period to prepare them for the Middle School Examination, and also in Drawing and Mensuration for the tests presented in the V or VI Standards of the Code. To allow of this being done each District Normal School must have its staff strengthened by a teacher capable of teaching all those subjects. Such teachers are not available in any number at present, but we understand that if proper encouragement is offered, there will probably be no difficulty within three years in supplying such teachers to all the Normal Schools. For the efficient teaching of the students, when there is no District Farm in the neighbourhood or within easy reach, it will be necessary to have a small plot of land of the extent of two or three acres for practical demonstration, to be worked on the lines we have sketched for the farm *annexe* to the College of Agriculture, but we hope that our recommendations regarding experimental farms will receive the support of Government,—and in that case the students should be required to take part in the operations of such farms. Again in such cases we believe that it might be better to utilize the services of the Superintendent of the farm as teacher of such students in Agriculture, the students however remaining under the control of the Headmaster of the Normal School, when not on duty at the farm. In such cases the teacher of Agriculture, Drawing and Mensuration at the Normal School need not be a man of so high attainments in Agriculture as would otherwise be the case. Ordinarily he should have a certificate at least of the Secondary Grade Lower in Agriculture. The agency which we here suggest will, we believe, suffice to provide in the course of a few years, a small band of teachers capable of teaching Agriculture, Mensuration and Drawing for the new Primary Examination, and even for these subjects in the V and VI Standards. It is to be remembered that many Primary schools are now Board schools and consequently that the well-qualified teacher is pretty sure to secure suitable employment, for the Boards will be deeply interested in preparing pupils for the Primary Examination, it being the test for the lower grades of the Public Service.

127. As regards secondary schools, we do not consider it necessary to discuss the subject here, beyond observing that we regard it as a matter of great importance, especially for students ending their studies at the Middle School standard, that Agriculture should hold a favored position among the optional subjects of that examination. This it will probably do if the High School Examination is prescribed. As regards teachers, the supply will soon overtake the demand when the subject is recognized as an important one, in connection with admission to the Public Service.

128. Another point to which we consider it necessary to draw the attention of Government is the desirability of encouraging some of the best students, who pass the Middle School Examination in Agriculture, to resort to the College of Agriculture for the shorter course. Such encouragements, we think, should be afforded by District Boards,—help being given to them towards the scholarships they may grant. Help is obtainable under the Grant-in-Aid Code.

129. We have considered the question whether school-farms should be attached to Primary and Middle schools, and we have come to the conclusion that this should be left to the option of Local Boards and to private effort.

130. One last point to which we would draw attention is the provision—in due proportion to other subjects, such as natural phenomena, moral stories, natural history — of lessons relating to agriculture in the Vernacular Readers in use in the several standards. We do not desire that the Readers for the agricultural classes should be permeated with agricultural truths to the exclusion of other matters equally necessary for the moral, social and material well-being of the people, but we do think that lessons of a simple kind in agriculture and rural economy should form parts of all the Readers in use among the people, and also that even in other lessons, so far as may be practicable, illustrations should be taken from the rural experiences of the people. We would advise that when next these Readers are revised the Educational Department should be instructed to bear the matter in mind. But whilst holding this opinion we see no objection to the preparation of a series of Readers bearing more directly on the agricultural conditions and the rural economy of the country. The use of such Readers should be optional, but their existence would enable those who wish to supplement the ordinary primary education of the people by knowledge based upon the chief facts of their social experience and activity, to put their ideas into effect. In any case the books, if prepared on proper lines, will form suitable reading for the agricultural classes.

Something in this direction has been done in Joyes' Second Reader and Second Book of Lessons.

131. We are decidedly of opinion that the Agricultural Department should be administered as heretofore by the Board of Revenue. It is the expressed desire of the Government of India that the Department should be closely connected with the existing administration, and the Revenue Board combines within itself nearly every agency connected with the land and with the agricultural classes, whether in the matter of the settlement and collection of assessment, the control of forests and of minor irrigation, the preparation and collection of statistics and records, or the supervision over district subordinates. An Agricultural Department not under the control of the Board would, both at its centre and in the districts, be entirely outside the ordinary and influential agencies of administration. As to the control of the Department by the Member who supervises Settlement, we consider the objections raised by two officers to be more sentimental than real, while the advantages on the one hand to Settlement that it should have command of agricultural details, and on the other to agriculture that its claims should be under the consideration of the very same officer who deals with the land assessment, are far greater than the objection raised even if it were valid.

Question 13.—Whether the Agricultural Department ought to continue to be administered by the Board of Revenue?

132. To the last question, we would reply that, at present, the Department, which is really in its infancy, will be amply occupied in working out the purely agricultural problems which we have dealt with above, and that its energies should therefore not be wasted by attempts to deal with other branches of industry, however important. It may be possible, as the Department assumes its proper place in the administrative organization and is relieved, by local public spirit, of much detailed elementary work, to develop it into a Bureau of Industries, but we do not consider that that time has yet arrived.

Question 14.—Whether the Agricultural Department ought to be restricted to matters connected with agriculture?

133. We have now reached the conclusion of our task and desire merely to add that in our recommendations we have kept in view only those developments which seem to be immediately and in every way advisable, and which are essential if the Department is to be a real and potent factor in the chief industry of the country, and if it is, in actual fact, to be made efficient for the benefit of the agricultural community.

(Signed)	W. WILSON, *Chairman.*	(Signed)	T. MADAVA ROW.
(,,)	J. GROSE.	(,,)	P. CHENTSAL RAO.
(,,)	H. B. GRIGG.	(,,)	JOHN ADAM.
(,,)	F. A. NICHOLSON, *Secretary.*	(,,)	A. SABAPATHI MOODELIAR.

MADRAS, 5*th May* 1889.

MEMORANDUM BY RAJA SIR T. MADAVA ROW, DATED 19TH MAY 1889.

Having just signed the Report of the Agricultural Committee to the Government, I beg leave to offer a few general observations which may be taken for what they may be worth.

The scheme proposed in the report for the consideration of Government is large, because it was desirable to present one, as far as possible, complete in its details and proportions.

It would not, of course, be necessary to undertake the execution of the scheme *at once in all its integrity.*

It would rather be desirable to carry the scheme into effect, part by part, according to considerations of convenience and importance. Those parts should be first taken up which may be conducive to the earliest fruits.

Examples of these are as follow :—

(1) The formation of an organization including district agencies as indicated in my memorandum, dated 31st March 1889.
(2) The collection and recordation of the empirical knowledge which the ryots possess about agriculture, cattle-diseases and their remedies— a work which may be started at once.
(3) The ascertainment of the existing grievances of the ryots and their redress or mitigation as far as possible.
(4) The establishment of a few experimental farms in districts within easy reach of Madras.
(5) The starting of such experiments therein as are easy and important and may be brought to a conclusion in a year or two.
(6) The demonstration of the advantages of ploughing with improved ploughs.
(7) The demonstration of the advantages attendant upon the use of the drill plough.
(8) The growing of cattle food.
(9) The demonstration of the use of new or unknown manures, &c., &c.

As it is desirable to bring scientific agricultural education as early as possible to bear on the country, I would not make the College syllabus too heavy. I would rather make it light at first, subject to extension in the future, if found necessary. I would deduct from it such subjects as have no immediate connection with Agriculture, such as Mathematics, Mensurations, Surveying and Levelling, Building Materials and Construction, Hydraulics, Kinetics, Statics and Forestry, &c.

In other words, I would concentrate attention on Agriculture. Agriculture should have attention prior to cattle. Similarly, cattle *disease* prior to cattle *breeding.* There need be no hurry about the Agricultural Education of the ryots who are an illiterate class and who will have to be taught only through the vernacular language. The cure or mitigation of the existing grievances of the ryots should have attention prior to improvement of their practices.

The higher authorities must exercise strict supervision, in order to prevent the lower ones from drifting beyond prescribed limits as to time, money, area and subjects.

The last remark I have to make is, that I wish it were possible to make some provision somewhere for the revival or intruduction of some simple village industries to usefully occupy the spare time of the ryots and their families (*vide* my memorandum, dated 31 March 1889).

MYLAPORE,
19*th May* 1889.

T. MADAVA ROW.

MEMORANDUM BY RAJA SIR T. MADAVA ROW, DATED 31ST MARCH 1889.

(1) I will make a few necessary preliminary remarks.
(2) Then I will state what should be done.
(3) We know how much the department has failed.
(4) It has failed, because its operations have been too theoretical, too independent of Indian knowledge and experience, too extensive and indefinite, too listless of the views and wishes of the ryots.
(5) We must now proceed upon revised and better lines.
(6) These I will briefly indicate subject to discussion in committee.

Q. No. 8.—(1.) A strong and complete organization should be established which would bring into service the necessary European scientific knowledge, Indian agricultural knowledge and experience, general intelligence and earnestness, familiarity with and influence over the ryot classes, and their confidence.

This organization appears to me to be of the most vital importance.

(2) All existing knowledge and experience of Indian agriculture should be carefully collected under well-arranged heads so as to constitute data for the construction of an Indian agricultural science.

Without this nothing practical could be done, I am sure.

(3.) The organization should be made instrumental for ascertaining the views and wishes of the ryot classes in order to raise existing agriculture to their own best standard.

This is also of vital importance.

(4.) All possible facilities should be afforded to those classes to do so.

Much practical good will follow.

(5) Experiments might be made on moderate scales and in selected localities with a view to possible new discoveries.

(6) Opportunities might be given to the ryots to see, try and select new agricultural implements.

(7) Opportunities might be given to the ryots to see, try and select new manures.

(8) Opportunities might be given to the ryots to see, try and select new seeds.

(9) Opportunities might be given to the ryots to see, try and select new breeds of cattle.

(10) Encourage or revive small domestic industries such as of rough wearing cloths for both men and women, bed and covering cloths, woollen blankets, packing sacks, mats, bags, baskets, &c., &c.

(11) No general agricultural education should be attempted until the department will have ascertained what may be usefully taught beyond what is already known.

(12) That system of keeping irrigational works in repair should be adopted which the organization would recommend as the best.

This is more practical and important than every thing else.

(13) Operations should be carried on on these lines for a limited period of five or seven years, subject to a revised programme with reference to the experience that will have been gained. In other words, proceed tentatively at intervals of five to seven years.

Q. Nos. 9, 10 *and* 11.—On these points, there is abundant information on record.

Q. No. 12.—I think that the College need not remain under the "Director of Public Instruction," because, according to my views, the instruction to be imparted by it should be very much limited in regard to numbers, area, purpose, time and funds. The main object of the College should be to specially train an agency for *executive* purposes.

Q. No. 13.—I think that the Agricultural Department should be administered by the Board of Revenue, because this possesses the knowledge and experience and interest and influence necessary to direct, to guide, to control and to assist the Agricultural Department.

Q. No. 14.—I think that the Agricultural Department should extend and be restricted to matters more immediately connected with agriculture.

MADRAS,
31*st March* 1889.

T. MADAVA ROW.

APPENDICES.

APPENDIX A.

GOVERNMENT ORDER APPOINTING THE AGRICULTURAL COMMITTEE.

READ—the following Minute by His Excellency the Governor on the Agricultural Department, dated 7th September 1888.

ORDER—dated 25th September 1888, No. 686, Revenue.

Miscellaneous.

His Excellency the Governor in Council thinks it expedient that a comprehensive inquiry should be instituted into the constitution and operations of the Agricultural Department with the view of ascertaining what practical good it has done and is doing, and what good such a department might do under other conditions. He has accordingly resolved to appoint a Committee consisting of the following official and non-official gentlemen, the latter having signified their willingness to give their services for the investigation :—

Official.	*Non-official.*
W. Wilson, Esq., Chairman.	Rajah Sir T. Madhava Row, K.C.S.I.
J. Grose, Esq.	Hon'ble P. Chentsal Row, C.I.E.
F. A. Nicholson, Esq., Secretary.	J. Adam, Esq.
	Rai Bahadur A. Sabapathi Mudaliar Avargal.

2. The Committee's inquiries should be directed to the following points and the Government trust that they will be able to submit their report within a period of three months :—

(1) What benefit has accrued or is likely to accrue to the cultivating classes from the Agricultural Department as at present constituted?
(2) What improvement it has effected or is likely to effect in seeds, implements, breeds of cattle, sheep and horses and methods of cultivation throughout the Presidency?
(3) What inducements does it hold out to ryots to improve their stock and mode of agriculture?
(4) Its operations in regard to cattle disease, and the benefits resulting from those operations.
(5) The operations in connection with, and the benefits derived from, the stock farm administered by the Department—with financial results.
(6) Whether the breeding of stock can be properly or economically carried on by Government.
(7) The duties of the officers employed under the Department.
(8) The best means of increasing the efficiency of the Department, having special reference to the benefit of the agricultural community.
(9) The course of study pursued at the College of Agriculture.
(10) The class of students at the College and the conditions under which they come to it.
(11) Whether the students engage in agriculture after leaving the College?
(12) Whether the College ought to remain under the control of the Director of Public Instruction?
(13) Whether the Agricultural Department ought to continue to be administered by the Board of Revenue?
(14) Whether the Agricultural Department ought to be restricted to matters connected with agriculture?

(True Extract.)

(Signed) C. A. GALTON,
Ag. Secretary to Government.

To the Public Department.
„ the Educational Department.
„ W. Wilson, Esq., M.A., C.S.
„ J. Grose, Esq., M.A., C.S.
„ F. A. Nicholson, Esq., C.S.
„ Rajah Sir T. Madhava Row, K.C.S.I.
„ the Hon'ble P. Chentsal Row, C.I.E.
„ John Adam, Esq.
„ Rai Bahadur A. Sabapathi Mudaliar Avargal.
„ the Commissioners of Land Revenue.
„ the Commissioner of Revenue Settlement, Land Records and Agriculture.
„ the Editors' Table.

APPENDIX B.

AN HISTORICAL NOTE ON THE WORK OF THE AGRICULTURAL DEPARTMENT, BASED ON THE RECORDS OF THE BOARD OF REVENUE.

By C. BENSON, Esq., M.R.A.C.

1. *Introductory and General Early History.*—Although, as long ago as 1842, efforts were made to introduce American cotton as a staple crop into the Presidency, and in the years 1855—59 agricultural and general exhibitions were organised at several places in the mofussil, and desultory individual experiments and attempts at agricultural improvements were made by district officers from time to time, it appears that it was not until the year 1863 that the attention of Government was specially drawn to the necessity of, and openings for, agricultural improvement in the practices of the ryot. In that year Sir William Denison drew attention to certain defective agricultural practices prevailing and proposed certain action, referring especially to the introduction of improved agricultural implements. Certain implements and machines were ordered out from England, and the Board were ordered to include allotments for exhibitions in their next budget of charges. This minute may be said to be the first chapter in the recent history of the efforts of Government at agricultural improvement.

G.O., dated 6th Nov. 1863, No. 1994.

2. In 1864 the Collector of Chingleput proposed to reclaim certain waste land, the property of Government near Saidápet, and then to convert the estate into a model farm; this the Government in 1865 decided to do, as they considered that "in this Presidency the Government are in fact very much in the position of landlords, and reaping the benefits of the position, cannot ignore its obligations" and that the advancement of agriculture was an object of the highest consequence. The farm was to be used for—

G.O., dated 27th Sept. 1864, No. 1784.
" " 26th Mar. 1865, " 680.

(*a*) The full trial and exhibition of the agricultural implements received from home in reference to requisitions of earlier years.
(*b*) The trial of artificial manures under careful supervision.
(*c*) The exhibition to the people of an improved system of agriculture.

The farm * was then placed in charge of a committee of gentlemen, which continued in existence until 1871. The results of work done on the farm are narrated in the "Saidápet Farm Records" and in more detail in the annual reports of the same institution; but it must, however, be noted that, as the farm was the first and only institution of the sort in Southern India, a great amount of work in experimental agriculture of a description not usually undertaken on experimental farms had to be performed; much most elementary work had to be undertaken; and, as experience in farming accumulates very slowly and as each result needs confirmation under differing conditions and circumstances, data accumulated very slowly; and that the farm had, besides ordinary experimental work, to do much of the work which elsewhere falls to acclimatization and agricultural societies.

* In 1876 a review of the work done on the Farm was called for and will be found in the paper noted on the margin, and again in 1878 a somewhat similar review was prepared in reply to a question from the Government of India as to the steps taken to impart to the agricultural classes the lessons learnt by the operations of model and experimental farms, which will be found in G.O., dated 4th September 1878, Mis. No. 1424. At about the same time the questions of the Famine Commission elicited an almost identical reply from the Superintendent of Government Farms, which was almost entirely endorsed † by the Board of Revenue. In their Proceedings on the review embodied in G.O. of 4th September 1878 noted above, the Government of India recognised that in Madras a department of agriculture practically existed and that its expansion was impeded chiefly from want of funds. This department had sprung up in connection with the Saidápet Farm.

B.P., dated 25th Sept. 1876, No. 2426.

† See page 135 of their replies to the Famine Commission questions.

G.O., dated 20th Feb. 1878, No. 439.

3. The Committee of Management, after various attempts to carry on the work there in other ways, decided, with the approval of Government, to obtain a Superintendent, who should be "a highly educated farmer, acquainted with agricultural chemistry and machinery and possessed of a thorough practical knowledge of all farming operations, the management of cattle, sheep, &c." The officer selected on these grounds arrived in November 1868 and for the next three years carried on the work of the farm under the control of the Committee. In 1869 it was resolved that the services of the Superintendent should be utilised in reviewing the reports of such miscellaneous experiments as might be made in the Presidency by different officers, and at about the same time Government placed the charge of the distribution of seeds for experiment also in his hands. In the same year the Board called upon all Collectors to report on the best measures for the introduction of improved agricultural appliances into their districts. This led in the following year to the submission of certain proposals and to the resolution of Government in 1871 to place the work of agricultural improvement on a more definite basis and to extend their operations over a wider field. They resolved to establish "model farms of moderate size in several localities with the view of demonstrating to the ryot the practicability of effecting sensible improvements by means quite within their reach." But in stating the objects to be aimed at, it is evident that the farms were to be experimental. The objects were—

Para. 4, report 1867-68 in G.O., dated 12th June 1868, No. 1653.

G.O., dated 17th June 1869, No. 1728.
" " 28th July " " 2209.

B.P., dated 29th July 1869, No. 5544.

G.O., dated 22nd Sept. 1871, No. 1657.

(1) To ascertain by experiment the proper use of rotation in crops in this country.
(2) To introduce a system of root or green-crops in lieu of fallow without artificial irrigation.
(3) To introduce new crops.
(4) To provide new kinds of seed and fresh seed for the crops now cultivated.
(5) To make experiments in the use of water for the cultivation of crops now termed "dry" crops and for raising grasses and other crops to be used as fodder.
(6) To make experiments in the use of lime and other manures—mineral and animal.
(7) To introduce new and improved implements of rural labor.
(8) To improve the working cattle, sheep, horses and other varieties of live stock in the country.

There were to have been four farms, one each in Bellary, Coimbatore, Tinnevelly and Ganjam. These farms were to be under the general charge of Mr. Robertson, in addition to his duties at Saidápet, and to be supervised by native Superintendents who were to be trained by him at Saidápet. The Saidápet Farm Committee was then disolved, and all further agricultural work was conducted by the Superintendent under the control of the Board.

4. In the meanwhile a class of apprentices had been formed at Saidápet for the training of farm overseers and subordinates generally. Difficulties were experienced in filling the class for training district farm Superintendents with men of the right stamp, and these led to proposals being made for the introduction of a system of agricultural education based on the Irish system and for obtaining an Assistant to the Superintendent from Europe. The former measure was then considered premature, but it was decided to obtain an Assistant for Mr. Robertson. This Assistant arrived in Madras in March 1874 from England, but in the mean while another European Assistant had been obtained by demi-official arrangements from Germany. He arrived at the end of 1873. The former of these Assistants was intended to take immediate charge of the Saidápet Farm so as to relieve Mr. Robertson there; which arrangement was carried out: and when the second Assistant arrived he was designated to take charge of the district farm then to be started at

G.O., dated 7th April 1873, No. 397.
" " 28th Nov. " " 1320.
" " 3rd Mar. 1874, " 290.
" " 25th " " " 356.

Coimbatore—a step which was never taken, as the farm was never started. He was, therefore, also employed at Saidápet.

5. Whilst these arrangements were being made, the Board of Revenue had, however, been led to the conclusion that the commencement of systematic instruction in agriculture should not be deferred but should precede the adoption of the system of "model" farms decided upon in 1871; but in this they were not unanimous, as their First Member, Mr. G. S. Forbes, pointed out that the Superintendent of Government Farm's acquaintance with Indian agriculture was very limited and urged a careful study of it and strongly urged the adherence to the original policy of 1871. During the year, however, the Board appear to have wavered in their opinion, as in November they endorsed Mr. Forbes' recommendation for Mr. Roberston's fully and carefully studying the real condition of agriculture in the Presidency before any attempt should be made at founding a system of agricultural education. These papers were not disposed of until early in 1875, when the Government considered it desirable to make use of the means at hand for the commencement of a system of agricultural education and called for detailed proposals designed to that end, and in the course of the next year approved and sanctioned the prospectus and curriculum of studies for the School of Agriculture. That institution was opened at Saidápet in 1876, Government regretting the delay which had occurred in inaugurating the system, and strongly impressing on the officers concerned the necessity for making the work successful. This completes the history of the origin of the system of agricultural education in this Presidency.

B.P., dated 20th June 1873, No. 1066.

B.P., dated 25th Nov. 1873, No. 2410.

G.O., „ 19th March 1875, „ 446.

G.O., dated 24th Nov. 1875, No. 1683.

„ „ 18th May 1876, „ 642.

6. Practically, for many years no attention was given to the study of native agricultural practices, but, the Board's repeated references to the necessity for the Superintendent making a study of them led to Mr. Robertson's proceeding to Coimbatore on a lengthened tour early in 1876, a report on which was furnished in 1877 and reviewed by the Government. Mr. Robertson had previously visited and reported on the Nílgiri district, but it was not until the year 1878 that any further steps were taken to proceed with the study, when one of the Assistant Superintendents was deputed to make a tour in the Trichinopoly district, on which a report was also submitted. This tour was followed up by others, made by the same officer in the following years during the vacations of the School of Agriculture, in the Cuddapah and Bellary districts, but then for a time all detailed study in the field of native agriculture came to an end. It was resumed by a tour made in the Godávari and Kistna deltas in 1883, on which a report was made, but that and subsequent action in this respect comes more properly for notice in a later part of this paper.

7. The district farm scheme adopted in 1871 was never carried out. Attempts were made to find sites in Bellary, Coimbatore and Tinnevelly, but it was only in the second district that anything was really done towards the acquirement of one, and even there the proposal was finally dropped. In 1877, however, fresh proposals were made to modify the scheme alluded to above, and the whole course of the discussion was reviewed by the Board, when they urged the necessity for adopting a more settled and declared policy than had hitherto been followed; but the consideration of this revised scheme, involving as it did considerable expenditure, was postponed. In the meanwhile, the Director of Public Instruction had suggested that it was advisable to extend the system of agricultural education to mofussil colleges and high schools, and the Government expressed their willingness to consider any well-devised scheme for the purpose. This led to the submission of a scheme of a comprehensive nature for district farms and schools, in modification of that proposed by the Board in 1877, which, however, was not entertained, and the district farm scheme

B.P., dated 13th Dec. 1877, No. 5223.

G.O., dated 23rd March 1880, No. 358.

dropped entirely out of sight except in so far as the connection of agricultural classes in mofussil schools therewith is concerned. This matter is dealt with separately below in connection with the subject of agricultural education.

G.O., dated 21st Feb. 1881, No. 327.

8. *The Saidápet Farm.*—In the meanwhile all work in regard to experimental agriculture, except and in so far only as the work done in the mofussil for the introduction of new staples is concerned, has been confined to that done on the Saidápet Farm, the Records of which have been mentioned already and need not be further alluded to. The early efforts of the committee were devoted to many things which experience has proved to be unsuited to the conditions met with in the Presidency. From 1871, the objects held in view were those, as already noted, laid down by Government for all Government farms, modified by the necessities of the Agricultural College when it was started in 1876. In 1870-71 a portion of the farm was set aside as a commercial farm, which experiment was brought to a close in 1876, the circumstances attending the close of the experiment being alluded to in the report for that year.

It was then intended to utilise the land thus set free for the purpose of carrying out an idea suggested in 1873, namely, the development of dairying and grazing. That idea had led to proposals being made for taking up more land adjacent to the Saidápet Farm estate; these were given up when the difficulties found in the way were discovered, and it was then decided to remove the Commissariat slaughter-yards from the farm; but in this case also the difficulties in finding a site for them prevented any action being taken in the matter and they were never moved. In the meanwhile experiments in dairying were being proceeded with, and cattle for that purpose had been imported from Aden, the results of which are set forth in the Saidápet Farm Records. The success of these experiments in dairying led to further importations being made in 1881 and 1883 from Aden.

Sheep-breeding had at an early date received the attention of the Committee of Management. The work done in this respect is also narrated in the Records alluded to.

In 1879, the idea of working a part of the Saidápet Farm on commercial principles was revived, but was strongly protested against by the Superintendent and the objections to the course pointed out, and though the accounts of the cost of cropping a small portion of the estate were separately kept for a few years, it was never carried out.

G.O., dated 26th June 1879, No. 1346.
" " 25th Oct. " " 2092.

9. *The Introduction of new Staples.*—Without alluding to the cotton experiments made as far back as 1842, many others have from time to time been made, but the only crop which it is believed has securely gained a footing in the presidency is the Mauritius sugarcane.* Very large quantities of valuable seeds have from time to time been imported and distributed, in addition to quantities raised on the Saidápet farm for the same purpose. As early as 1871, the unsatisfactory nature of the results obtained from the course pursued in distributing these seeds to uninterested ryots was brought to notice, and the Superintendent of Government Farms, whilst urging the advisability of continuing the distribution of good seeds and an extension of the practice, suggested the offer of prizes for the best crops grown by voluntary experimenters, but though the idea was accepted, it was never fully carried out. A further development of these ideas was suggested in 1883, but was not accepted. The ideas set forth then were of much wider scope and related not only to the introduction of new staples, but to the supply of superior seed of indigenous crops, in connection with which attention may be drawn to the scheme drawn up for the benefit of the Government of Bengal in 1873.

* See Board's reply to Famine Commission queries.

G.O., dated 5th July 1873, No. 694.

B.P., dated 19th June 1883, No. 1767.

G.O., " 17th Dec. 1873, " 1448.

10. *Irrigation Experiments.*—As far back as 1872, the Government decided that experiments to determine the quantity of water required to bring rice-crops to maturity should be carried out on the experimental farms then about to be started; but as these farms were never started, very little was done in the matter. The facilities for the purpose afforded by the Saidápet Farm were not great, and it was found practically impossible to increase them much, so that, although some preliminary experiments were conducted there to that end in the years 1882-83 and 1883-84, and arrangements for carrying them further were in progress when it was finally decided to abandon the farm as an experimental institution, nothing has been done effectually in the matter.

G.O., dated 13th June 1872, No. 1458.

11. *The Introduction of Implements and Machinery.*—In his minutes of October 1863, Sir William Denison advocated the introduction of certain implements and machines for exhibition to the ryots, as he considered that those they possessed were very inefficient, and application was accordingly made to the Secretary of State for a supply. Early in 1865 arrangements were made for turning to the best account those supplied in reply to the requisition, and most of the machines were either distributed to Collectors and a few gentlemen, or sent to the Remount Depôt at Hosúr; a set was, however, detained for exhibition along with the steam plough imported. The last-named machine was tried in several places with unsatisfactory results, and in 1869 a report on it was ordered to be referred to Major-General Cotton for remarks, but there is nothing to show that any report was received from him, for the machine continued to lie at Saidápet for many years later.

G.O., dated 27th February 1865, No. 424.

G.O., dated 1st June 1869, No. 1532.

In 1868, the Board submitted a general report on the results obtained with the machines and implements referred to above, which was forwarded to and reviewed by the Secretary of State, and although the results were regarded as not having been very satisfactory, the experiment, it was thought, might be the forerunner of a general improvement of the agriculture of the country. This led to a further reference to Collectors and others as to the measures to be taken to encourage the introduction of improved agricultural appliances, and the review of the replies formed the basis on which the resolution of Government to start district farms was founded, the Saidápet Farm having already, it will be remembered, been originally started in part for the trial of these machines. The experiments referred to in the papers quoted above cannot, however, be said to have done more than excite a considerable amount of official attention to the matter of improving native implements of husbandry.

B.P., dated 15th April 1868, No. 2766.

G.O., „ 17th June 1869, „ 1728.

B.P., dated 29th July 1869, No. 5544.

G.O., „ 22nd September 1871, No. 1657.

At the Saidápet Farm considerable attention was directed to machines and implements, and in 1868 the Farm Committee applied for permission to keep a stock of implements for sale. In 1869 they appear to have begun to manufacture tools for sale, and in 1870 workshops for the manufacture of implements and tools to meet the local demand were started, which were maintained until the year 1879, when they were closed, as it was not considered right that Government should interfere in the trade. During these years large numbers of implements, &c., were sold from the Saidápet Farm, and many were experimented with.

In 1875, Colonel Michael, C.S.I., drew attention to certain ploughs of Swedish manufacture which appeared at the Vienna Exhibition, and specimens of them were obtained and on the whole favorably reported on in 1877, but it was not until about three years later that their suitability to a special class of work was discovered, and a brisk demand sprang up for them in the Bellary district, which led not

G.O., dated 27th Aug. 1877, No. 2587.
„ „ 14th Jan. 1881, „ 111.

only to a further large importation of the ploughs by Government for distribution, but to importation of similar ploughs by Mr. Sabapathy Mudaliar for sale in that district. The final report on the ploughs imported by Government for distribution was not, however, on the whole very favorable.

G.O., dated 3rd June 1882, No. 579.
" " 1st May 1882, " 576.

The more recent work done towards the introduction of implements and machines will be found referred to below, but the operations of the department are now chiefly confined to testing new implements and machines, as the demand for such things as ploughs and sugar mills has encouraged local agents and manufacturers to compete for the supply.

12. *Agricultural Education.*—The development of the general policy of Government, which in 1876 led to the foundation of the School of Agriculture, has already been alluded to. A complete abstract of the discussions on the subject is given in the first annual report of the College, *i.e.*, that for 1876-77. The institution was then placed in charge of the Superintendent of Government Farms under the general control of the Director of Public Instruction acting in communication with the Board of Revenue. Twenty-four stipends were offered for competition amongst students to be awarded at the close of the first session; a class of 30 students was formed, and the institution began work in the granary belonging to the Saidápet Farm in November 1876. At the same time arrangements were made for the attendance of 13 students of the Normal School, Madras, at the lectures on agriculture. The curriculum was to embrace Agriculture, Veterinary Surgery and Medicine, Chemistry, Botany, Zoology, Geology, Land Surveying and Mensuration, Mechanics, Drawing and Book-keeping.

The temporary arrangements as to accommodation were found excessively inconvenient, and their inadequacy prevented the admission of any new class in 1877. In 1878, however, a chemical laboratory was commenced and temporary special buildings were erected for use as class rooms. A fresh class was formed in the October of that year consisting of 33 students, the number of stipends offered having been reduced to 15. In the year 1878-79 it was determined to start a veterinary hospital in connection with the College, the want having been much felt, and buildings for that purpose were erected in the year following. Rules for the award of the college certificate were also framed, and it was determined to alter the date for the admission of classes from September to April from the beginning of 1881, so as to allow of matriculated students being admitted soon after passing their examination. The Lecturer on Zoology also resigned during this year, and no one was appointed in his place.

G.O., dated 22nd August 1878, No. 1348.

During the summer of 1879, orders were given for the entertainment of another class of students, but the number of stipends offered by Government was cut down from 15 to 5, and it was found impossible to form a class of fair size, and the entertainment thereof was postponed till April 1880. In the meanwhile the Government were asked to reconsider their decision as to the number of stipends, but declined to do so, and ordered the Board to endeavour to induce zemindars to send pupils to the college, and suggested that the Court of Wards might do the same. These proposals did not meet with a favorable response from the zemindars, and the Court of Wards did not consider themselves justified in sending pupils to the college, and the matter was allowed to drop.

G.O., dated 26th May 1879, No. 1144.

G.O., dated 26th Nov. 1879, No. 2203.

G.O., dated 6th Oct. 1880, No. 1300.

In the meanwhile the first class of students admitted had completed their course and left the college in June 1879, 16 gaining a first and 7 a second class certificate from the institution, leaving only one class under tuition for the greater part of the year. Early in 1880, the permanent buildings for the college were begun, and the veterinary hospital was nearly completed during the year. Early in the year a proposal to raise the standard for admission was made, but any alteration was postponed after discussion for fear of the effects.

The summer session of 1880 began with two classes—one, the senior, of 24, and another, newly admitted, of 10 students. In the latter class not one of the 8 applicants qualified for immediate admission was a Madras man. By the winter session 3 students of the senior class had left and one withdrew to join the junior class. During this year (1880-81) the general control of the institution was transferred from the Board to the Director of Public Instruction, progress was made in the erection of the permanent buildings, and the veterinary hospital was completed, but not opened.

In the year 1881-82, a new class of 9 students was admitted in April, and at the end of the summer session 24 senior students obtained the certificate of the institution. During this year a new scheme for working the institution was brought into force and a class of 26 students admitted at the beginning of the winter session. That scheme was briefly:

G.O., dated 12th Aug. 1887, No. 256.

Admission to be open to the same classes as before, the educational qualification being practically the same except that a first-class Middle School certificate was not required.

Students to be of three classes—stipendiary, free and paying.

Stipends to begin at once, increasing year by year, the rates differing for students from certain districts as in the case of normal students.

Number of stipends fixed at fifteen, ten or two-thirds of the stipends being annually awarded to ten districts to be given on the recommendation of Collectors to induce them to send young revenue employés for the course, and one-third by the Superintendent.

Full course to be three years.

During the year the lower story of the College buildings was completed and formally opened by His Excellency the Governor, and the veterinary hospital was completed and placed in charge of the Inspector of Cattle Diseases.

13. The records regarding the later history of the college and since its entire separation from the Agricultural Department under G.O., dated 7th January 1884, No. 3, are not complete in the Board's office and it can only be fully related by reference to the Educational Department. The reasons leading to the separation are alluded to at paragraph 32.

14. In 1876, when approving of the arrangements made for the organization of the School of Agriculture, the Government expressed a desire to encourage the acquirement of a fair knowledge of practical agriculture by schoolmasters in order to enable them to make agriculture a part of the curriculum in all elementary schools. It was then pointed out that the teachers in such schools have no knowledge of any language save the vernaculars, and that they could not be taught at Saidápet, and that the students of the Normal School, Madras, would become teachers chiefly in high, middle and normal schools, and not come into contact with the agricultural classes. But it was decided to arrange that the students in the latter institution should attend the lectures on agriculture at Saidápet and a special field class. It was at the same time suggested that an agricultural class-book should be prepared for use in the elementary normal schools, where the subject might well be taught.

The result of this arrangement was that during the session of 1876-77, 13 students attended lectures at Saidápet; during that of 1877, 20; during that of 1877-78, 23 at the early part, who left during the session, and 20 during the latter part; and during the summer session of 1878, 24. It was at a very early date found that the arrangement was unsatisfactory, and during the year 1877-78 after some discussion it was determined that the best course to pursue would be to arrange for a special short course of lectures to the normal students at their own college, which was done during the winter sessions of 1878-79 and 1879-80, but it was found impossible to repeat the course in the two following years, and though the Director of Public Instruction expressed the opinion in 1882 that "instruction, if given, must be something more thorough than can be given by means of a few lectures in the course of a session," the same course was repeated in that year, after which period the connection of agricultural education with the Board was practically severed.

15. In 1879 the Director of Public Instruction, in submitting the annual report on the School of Agriculture for the previous year, remarked that "it seems very desir-

able that steps should be taken at an early date for establishing agricultural classes in connection with some of our mofussil colleges and high schools and for utilizing as teachers some of the young men who have gone through the agricultural curriculum. The arrangements adopted in the Bombay Presidency seem on the whole suitable to this Presidency. The subject was discussed by Mr. Robertson and myself during the Christmas holidays, and he promised to submit a detailed scheme for the consideration of the Board of Revenue, but I am not aware what has been actually done in the matter." On this, the Government expressed the opinion that they would be prepared to consider any well-matured scheme that had a fair promise of success although they thought that the number of persons qualified to carry out the necessary course of instruction would be very limited.

G.O., dated 9th August 1879, No. 1660.

Previous to this, however, the Board had, it will be remembered, recommended to Government the adoption in its general features of a scheme put forward by Mr. Robertson in 1877 for starting a system of small educational farms in the mofussil in connection with existing schools and for opening classes on them, and in 1879 it was pointed out that men would soon be available to take charge of these farms. In the meanwhile the order of Government already alluded to was issued, and thereon ensued a good deal of discussion as to the best means of carrying out the idea, and the Government finally approved of the Board's suggestion for the experimental commencement of agricultural classes in three districts only, and called for detailed proposals. These were submitted towards the end of the year and were accepted as a tentative measure by Government early in 1881. The scheme included a three years' optional course of study and the offer of a reduction of fees and the establishment of scholarships to be held in the School of Agriculture. But although the Director of Public Instruction considered it essential to attach a small farm to each school where a class might be formed, the Government considered that this could be deferred till after the classes had been formed. Further discussion followed during the same and the following year, but the project was not finally disposed of until 1883, when Government decided to introduce agricultural instruction into the Government high and middle schools at Bellary, Salem and Madura, the course being compulsory in the middle, but optional in the high schools. But since then nothing has been done in the matter, and the scheme has been dropped.

B.P., dated 10th February 1879, No. 366.

G.O., dated 23rd March 1880, No. 358.

G.O., dated 21st February 1881, No. 327.

G.O., dated 17th September 1883, No. 610, Educational.

Letter from the Director of Public Instruction, dated 24th July 1887, No. 4625.

16. Early in 1887, Mr. Nicholson submitted a scheme to the Director of Public Instruction for extending the system of agricultural education to the masses through the agency of village schoolmasters trained in the mofussil normal schools, who should there learn practical agriculture which they would again teach in the primary schools. This scheme involves the provision of competent instructors at the normal schools and of educational farms attached to them for purposes of tuition. Mr. Nicholson's scheme is a large one and must be considered on his representations, but it is not known in this department what has been done regarding it.

B P., dated 15th August 1887, No. 277.

17. In 1879, Mr. Robertson reported that he had an elementary work on agriculture for use in middle class and village school under preparation, and this was published in 1880, both in English and the vernaculars, Mr. Robertson receiving an honorarium of Rs. 1,000 for the work. In 1881, a further offer of Mr. Robertson's to write a simple agricultural primer was accepted, but the records do not show further what has been done in the matter of agricultural text-books.

G.O., dated 12th May 1880, No. 163.

G.O., dated 19th November 1881, No. 371, Educational.

18. *Agricultural Exhibitions.*—In the year 1854 the Government reviewed the efforts made in previous years towards the promotion of the agricultural and manufacturing industries of the country, and they concluded that the success which had attended these efforts was not satisfactory, especially alluding to the work of the Madras Agri-Horticultural Society, which had been of so little apparent benefit that the Government at one time thought of declining further assistance. The Government however, thought it inadvisable to give the matter over as hopeless, as the trial had been only of short duration and the efforts rather desultory than combined and continued, and confined to the Presidency Town. They therefore resolved, whilst fully appreciating the difficulties of the question, to embark on a comprehensive scheme of exhibitions, and they thought that if "the effort should be general, generous and long continued" it would ensure success. They resolved not to hold any more agricultural shows at Madras, but to direct operations exclusively to the mofussil, where they hoped that local shows would excite a spirit of emulation and discussion. They, however, resolved to hold an exhibition of arts and manufactures at Madras early in 1855 :—

Extract from Minutes of Consultation, dated 14th July 1854, No. 705, Public Department.

On a representation of the Board of Revenue, made after consulting the Collectors regarding the means of carrying out the orders of Government, it was resolved to defer any shows except those at Rajahmundry and Guntúr until 1856. At the same time certain principles were adopted for guidance in working the scheme. There was to be a show in each district, with two in Canara, and the prizes awarded were to be given in money, although the winners were to have the option of receiving any equivalent they pleased and were also to receive a printed certificate. Only one prize was, as a rule, to be awarded in each class, and they were to be offered for—

Extract from Minutes of Consultation, dated 4th January 1858, No, 138, Public Department.

(1) The principal grain and other crops of the district, to a sufficient extent to excite the interest of the ordinary ryot in the shows. The grain was to be shown unthreshed.
(2) Cattle, sheep and poultry.
(3) More valuable produce ; such as cotton, indigo, sugar ; for which the prizes were to be more liberal.
(4) Improved agricultural implements; but only for some real improvement.
(5) Special products; such as oils, fibres, &c. ; and a small sum was to be allotted for extra prizes.

It was contemplated that Government would exhibit at these shows samples of superior products and specimens or models of improved implements, and the committees of management were to purchase moderate quantities of superior produce of the districts for display at Madras. The Board asked for an allotment at the rate of Rs. 3,000 for each district and Rs. 4,000 for Canara to work the scheme, and also urged that a fixed sum should be granted for three years in order to make the system definite. The Government sanctioned Rs. 58,000 for these local shows in 1856, and although they were not then very sanguine as to the results that might follow on that occasion, were satisfied that the shows would excite the interest of the people.

Extract from Minutes of Consultation, dated 31st October 1855, No 1410, Public Department.

19. The Board submitted two reports on the shows held in 1856, the results at which, they remarked, exceeded in every case the expectation of the local committees, and they regarded them as highly satisfactory, and that a good beginning had been made, the interest of the people excited, and their suspicions allayed. Altogether they thought the shows as successful as under all circumstances could have been expected, and were sanguine as to far more satisfactory results in 1857. The shows of 1856 were held in the following districts :—

Selections from Records XXXIII and XLV.

Rajahmundry,	Bellary,	North Arcot,	Trichinopoly,
Masulipatam,	Cuddapah,	Salem,	Madura,
Guntúr,	Canara,	South Arcot,	Tinnevelly,
Nellore,	Chingleput,	Tanjore,	Coimbatore,
Kurnool,			

and at the latter end of the year in Ganjam.

20. In the following year shows were held in the districts of—

Malabar.	Guntúr.	Salem.	Madura.
Canara.	Kurnool.	Tanjore.	Tinnevelly.
Rajahmundry.	South Arcot.		

And the Board considered that, though the results were not so favorable as anticipated, the reports were so encouraging that it was premature to anticipate failure because of this. On these reports the Board was empowered to sanction shows during 1858 in any district where there was a fair chance of success at a cost not exceeding Rs. 5,000 in each case, and a proposal to hold exhibitions in some districts biennially was approved.

Selections from Records L.

21. In the meanwhile the Secretary of State had reviewed the question of these exhibitions, and approved of the idea of restricting the shows to places where the results were most likely to be successful and the substitution of biennial for annual shows, and suggested whether the shows might not be held at places where two or more districts could be included.

Extracts from Minutes of Consultation, dated 11th March 1859, No. 374, Public Department.

22. During the year 1858, owing to the political circumstances of the Empire, no exhibitions were held, except a cattle show held in Nellore during December of that year; but in the early part of 1859, shows were held in the following districts:—

Bellary,	Ganjam,	Chingleput,	Tanjore,
Cuddapah,	Rajahmundry,	South Arcot,	Tinnevelly,
Canara,	Masulipatam,	Trichinopoly,	Madura,
Malabar,	Guntúr,	Salem,	

and in submitting the reports thereon the Board observed that the experiment had had a fair trial and failed to a considerable extent. The Government concurred in their views and resolved that the experiment should not be repeated till some time had elapsed, and there was, in the opinion of the local officers, some chance of success. They, however, resolved to continue the Nellore and Guntúr cattle shows annually, if the district officers were favorable on each occasion. The expenditure on these shows was, as far as the records show—

Selections from Records LXIV.

Proceedings of Government, Public Department, dated 7th October 1859, No. 1537.

	RS.	A.	P.
In 1856	31,564	3	6
„ 1857	20,557	1	6
„ 1859	35,486	10	9

23. Subsequent to 1859 the only show that was regularly held was one at Addanki in the Nellore district, which will be alluded to again below; but in 1862 inquiries were made of district officers whether there were good grounds for reviving the exhibitions, which led to a recommendation that shows should be held in Nellore, Coimbatore and Tinnevelly, and the Government on considering the question decided that it would be advantageous to renew the experiment of 1859 partially in the three districts named, but the sanction to hold a show at Coimbatore was shortly afterwards withdrawn and a slightly different experiment sanctioned for Bellary. The show proposed to have been held in 1863 at Tinnevelly was deferred till 1864. The Nellore show will be referred to below in connection with that held at Addanki in the same district.

G.O., dated 25th September 1862, No. 2083.

G.O., dated 24th December 1863, No. 2369.

In Bellary the shows were sanctioned on some suggestions made by Mr. Wedderburn, who made certain remarks as to the causes of failure at previous shows, in the course of which he suggested, in order to obviate the difficulty of centralization which he regarded as having been a cause of earlier failures, the award of prizes by taluks at the time of the annual settlement. The plan was tried in the years 1864, 1865, and 1866, but the result was not satisfactory.

At Tinnevelly, shows were held in March 1864 and April 1866; the result of the former was discouraging and none was held in 1865, and that in the latter year was so unsuccessful that the Government would not sanction a renewal of the experiment.

G.O., dated 1st June 1866, No. 1339.

Meanwhile, proposals had been made in 1865 by the Collector of Malabar for holding an agricultural and industrial exhibition at Calicut, early in 1867. One was sanctioned and held at the end of February in that year with results which the Government considered very satisfactory. At this show a large sum (Rs. 1,950) was subscribed locally to meet the expenses and to set free the Government grant for application mainly as prizes and rewards. The success of this show led to another being held in the same district later in the year, and the results of the Pálghat exhibition held in November 1867 were also considered as decidedly successful. At this show also local subscriptions came in to meet the expenses of the show.

G.O., dated 4th September 1867, No. 2060.

G.O., dated 18th April 1868, No. 1032.

A show was also held at Hosúr, in the Salem district, in the year 1864, and in 1865, Mr. H. S. Thomas, then Sub-Collector of the district, having suggested that another should be held at Kilamangalam in his division, prize lists were prepared, but the show originally fixed for November 1866 was postponed till the year following, but was apparently never held. A show was, however, held at Mécheri in February 1867 pursuant to a requisition of the Board made in January 1866, and the result was reported to be fair, and the show was repeated in the following year.

24. Towards the latter end of 1865 the Secretary of State pointed out the value of exhibitions for the encouragement of the increase and the improvement of agricultural stock and agriculture generally, and the Government added Rs. 10,000 to the budget allotment for exhibitions in fresh districts, and the Board called the special attention of all Collectors to the matter, but though considerable further correspondence ensued, excepting the show at Mécheri, no new ones appear to have been held.

G.O., dated 20th December 1865, No. 3067.

Besides the shows already mentioned, and those held in the Nellore district, no other ones appear to have been held from 1859 till 1874, excepting one on the Nílgiris promoted at the suggestion of the Collector, to give an impulse and encouragement to the planting interest and to native cultivators. It was held at Ootacamund in October 1869 and opened by the Governor, and, on the whole, was fairly successful.

G.O., dated 30th March 1870, No. 411.

The shows held during the period under reference were, therefore, as follows:—

	Cost. RS.	A.	P.
Tinnevelly.			
1864	2,268	13	10
1866	2,533	5	8
Malabar.			
Calicut, 1867	4,746	12	0
Pálghat, 1867	2,445	11	5
Nilgiris.			
1869	3,442	13	5

	Cost. RS.	A.	P.
Salem.			
Hosúr, 1864	...		
Mécheri, 1867	415	0	0
Do. 1868	226	12	0
Bellary.			
Taluk shows 1864	569	0	0
Do. 1865	665	0	0
Do. 1866	1,095	0	0

25. The Addanki cattle show was established in 1859 and prizes were given then at it to the amount of Rs. 665. A summary of the history of the show up to that date will be found in a letter from Mr. Dykes, Collector of Nellore, dated 28th January 1869. The show was intended to serve both the Kistna and Nellore districts, and it was found that the cattle brought were generally the finest specimens of the breed excepting in the case of cows, which it appeared the ryots did not like to exhibit. In 1862 strong efforts were made to overcome this, and the committee in referring to the progress made in overcoming the scruples of the ryots remarked that it was "a fundamental principle with the breeders of stock, that the improvement of cattle depends as much, if not more, on the amount of care bestowed on the rearing of the cows, as of the bulls." In 1865 His Excellency the Governor, Sir William Denison, attended the show and recorded a minute regarding it, and the Government decided that special encouragement should be given to the rearing and feeding of cows and heifers. The amount of the prize list had been gradually increasing and was Rs. 1,600 in 1866, special prizes being given for cows and heifers with good results.

B.Ps., dated 11th February 1869, No. 5935.

G.O., dated 16th March 1865, No. 531.

In the meanwhile a show had been established at Nellore also, and the two shows were continued year by year from 1863 to 1869 except in 1868, when the Nellore show was not held. In 1870 one show only was held at Ongole in October for the whole district, the earlier shows having usually been held in January and February. This show was not satisfactory however, as the place was evidently too remote for the breeders of the Kistna district to appear, and Addanki was reverted to in the succeeding year, and shows were held at that place and at Nellore in January and February 1871, respectively, and repeated during the years 1872, 1873 and 1874; whilst in 1875 only one show was held at Addanki, the Nellore show having been abandoned.

26. In submitting the reports on the shows for the year 1871, the then Collector disparaged the utility of the shows, and expressed a doubt whether any public good commensurate with the cost had been or was likely to be done by a show of the sort. He remarked that—

"My experience of Indian agriculturists renders me altogether sceptical in regard to the possibility, within any definite period, of forcing them either by precept or example appreciably beyond their customary grooves of action. In breeding and rearing fine cattle with more care than obtains in most other parts of the country the ryots of the sub-division are simply continuing to do what they and their ancestors have always comparatively excelled in. If it could be shown that a greater general degree of excellence either has been, or is likely to be, manifested as the result of the Addanki and Ongole cattle shows, then no argument would be needed in justification of the annual expenditure thereon; but I greatly doubt whether any such result either has been, or is likely to be, produced."

"So many sanguine expectations have been hitherto indulged in, and so many encomiums have been passed upon these cattle shows, that I do not flatter myself that much weight will now be attached to my remarks. I perform the invidious task of recording them, because the subject involving a considerable expenditure of public money, it is my duty to state the opinion I have formed, and I may add that in this opinion I am authorized to state that Mr. Thacker, the Veterinary Surgeon on special duty, entirely concurs with me."

"The Nellore agricultural exhibition, putting altogether aside the northern cattle, has, as far as I can judge, never been a real success. That of 1869 was evidently, when judged by present results, but a fictitious success, due entirely to His Excellency the Governor's visit, which again led to the presence of the Raja of Venkatagiri and other territorial magnates, all of whom naturally, under the circumstances, displayed a great interest in the exhibition. But, except under the provocation of a gubernatorial visit, it is no use attempting to disguise the unmistakeable fact that our district nobility do not care a button for agricultural exhibitions. While congratulating himself on their co-operation in 1869, Mr. Dykes plainly avowed in his report that the co-operation of the large landed proprietors was essential to real success. He said that successful exhibitions could no more be held in this country without their cordial help than they could be in Great Britain, were the nobility and landed proprietors to stand aloof and leave the shows to be supported entirely by the officers of Government and the farmers. In this

view, I entirely concur with Mr. Dykes, but like his my wishes are not father to my thoughts, and I am not sanguine enough to anticipate, I won't say genuine, independent, sustained interest, but any sort of interest on the part of our principal landholders in the Nellore exhibition, except when the same may be patronized by the Governor in person."

But the Board declined to accept his arguments or to give up the shows in deference to his adverse judgment upon them, and in this they were supported by the Government, who considered the results attained at the shows to be not nearly as discouraging as Mr. Vans Agnew considered them and thought they had exercised a wider influence in improving the breeds than was readily apparent, and directed the continuance of the shows. In those conclusions, the Secretary of State concurred and the shows were continued as noted above till 1875 in which year the opinions of the Superintendent of Government Farms and Veterinary Surgeon Western, then on duty as Inspector of Cattle Diseases, were obtained on the question of their value and the Government recorded their opinion that the shows were of much importance and had been of much value, remarking with reference to the results of the Addanki show of that year that—

G.O., dated 13th May 1871, No. 850.

G.O., dated 24th October 1871, No. 1840.

G.O., dated 24th August 1875, No. 1272.

" His Excellency the Governor in Council is satisfied from the results of these shows that a spirit of competition has been excited, which, if properly encouraged and directed, must lead eventually to the formation of a few herds of exceptional quality, such as must in the natural course of events establish value sufficient to induce the owners to part with individuals belonging to them.

" As observed by Messrs. Robertson and Western in paragraph 3 of their report the presence of even a single improved bull in a village is a cause of satisfaction, as such animals must eventually make their mark on the breeding cattle of the district and improve them."

After this, however, no further shows were ever held in the district, having been given up owing to financial pressure and never resumed. The expenditure on these shows during their continuance was—

G.O., dated 2nd September 1876, No. 1213.

	RS.	A.	P.
At Addanki, 1859—1869	14,380	11	6
„ Ongole, 1870	1,675	3	2
„ Addanki, 1871—1875	11,323	8	2
Total ...	27,379	6	10
At Nellore, 1863—1874 excepting 1870 and 1868	28,481	12	3

27. In 1873, Mr. Robertson submitted certain remarks and suggestions regarding exhibitions for the consideration of the Board in which he alluded to the results of the shows previously held as having been very disappointing, attributing this to—

G.O., dated 14th May 1873, No. 485.

(1) The country not being ready for the exhibitions.
(2) Too great results being expected.
(3) The shows being on too elaborate a scale and of too refined a nature and being modelled too much on the English plan.
(4) Want of perseverance in the system.

At the same time he pointed out that shows in this country should in general resemble the American State Fair; their objects should be educational and commercial; and that at them the ryot should be rather interested than surprised and astonished, and should find them marts for the sale and exchange of stock and produce. He advocated migrating shows like those of the R.A.S.E., and the award of trophies for district competition; the reading of papers on agricultural topics at the shows; and the offer of rewards for essays. The Board concurred generally in these views, and especially with those relating to making the shows exchange

marts for stock and produce and fairs generally, and the Government called for proposals for an exhibition to be held at Madras in 1874, which was accordingly arranged and held. This show was not such an undoubted success as could have been wished, but was far from being a failure, and the Board recommended that it should be repeated, the prize list being revised by the experience gained thereat and at the shows held in Lord Harris' time. In submitting a revised prize list, Mr. Robertson again alluded to the main feature of these shows being their educational value both to the ryot and to the Government, but the Board in submitting it to Government recommended that the show should be deferred until Mr. Robertson had visited some of the more advanced districts and studied the methods of agriculture practised there. This view was accepted by the Government and for various reasons and especially on account of the famine no further shows were held during the next eight years. In 1882, however, a general scheme for holding two shows annually at different places in the mofussil was submitted to and approved of by the Government, but it was decided that the first show on the system should be held at Madras. The places to be selected for the mofussil shows were to be specially chosen for their convenience of access or at places of pilgrimage, &c., and the time for the shows was to be fixed with reference to their coincidence with times of festivals, fairs, &c.

G.O., dated 13th June 1873, No. 605.

G.O., dated 18th September 1874, No. 1191.

G.O., dated 9th June 1875, No. 899.

G.O., dated 3rd March 1882, No. 257.

G.O., dated 9th September 1882, No. 959.

28. The first show under this scheme was organised and held at Madras in February 1883 and a full report thereon prepared, in reviewing which the Government stated that they considered the show had been on the whole a success. This exhibition was held just about the transition stage of the department, and though it more properly belongs to a later place in the history, the further development of the system may be alluded to here. After it had been held, some further discussion ensued regarding the working out of the policy adopted in 1882 regarding exhibitions, and it was finally determined to hold two shows in the mofussil annually and one at Madras quinquennially; but it was not until 1887 that it was found possible, owing to the adverse nature of the seasons, to hold any exhibitions. In that year one was held at Gooty and one at Erode. These were followed by others at Bellary and Salem during the current year, and it is intended to hold two more in the early part of 1889 at the two last-named places. Reports on these shows will be found in the marginally-noted papers, which also contain many suggestions for the improvement of the system in vogue.

G.O., dated 7th November 1883, No. 1373.

G.O., dated 30th January 1884, No. 146.

G.O., „ 10th July „ „ 832.

B.P., dated 17th November 1887, No. 455.
B.P., „ 14th June 1888, „ 270.

The experience gained at the mofussil shows led in the current year to the revision of the prize lists and to the submission of revised proposals for future shows, which have been for the most part accepted by the Government. The system of these shows at present in vogue is to offer prizes for the best live-stock, field, garden and animal produce, for machines and implements suited for use in India, and for a limited section of manufactured articles that are brought together. They are organised by the Collector of the district where they are held, and worked by him with the assistance of the officers of the department and a local committee.

The exhibition, which should have been held in Madras in 1888, was postponed last year till 1890, but quite recently the Government have stated that, for financial reasons, it will not be possible to hold one in that year.

29. In addition to these shows promoted entirely by Government agency, the department has afforded assistance and money in some cases to shows promoted by private enterprise at—

Chittoor, in 1884; Madura, in 1885; and at Rajahmundry, in 1885.

The show at Chittoor was promoted by an agricultural society formed there under the patronage of the Collector, which also started a small farm. The society and farm, however, both disappeared in 1885.

G.O., dated 10th May 1884, No. 624.

The show at Rajahmundry was promoted by private enterprise and a grant-in-aid of the objects of the show was made by Government.

G.O., dated 12th December 1884, No. 1379.

The show at Madura was organised by the Local Farmers' Club and received a grant-in-aid from Government, but though it was intended to continue the grant, no further shows have been held there.

G.O., dated 21st April 1885, No. 450.
" " 11th December 1885, No. 1368.

30. *Recent History.*—The organisation of the department as a distinct branch of the administration forms a clear landmark in the history of the efforts of Government for the improvement of agriculture and the details thereof may, therefore, be separately treated. The department was organised in 1882, under the instructions conveyed in Resolution of the Government of India, No. 6—340-50 G, dated 8th December 1881. The correspondence relating to its formation, and the work it was intended to perform is shown in the papers noted on the margin. The functions of the department as indicated by Government in March 1882, were—

G.O., dated 29th March 1882, Nos. 350-351.
" " 17th June " No. 635.

(1) The collection and record of statistics bearing on the vital and economic condition of the agricultural classes, with a view to agricultural improvement.

(2) The maintenance of village registers containing an accurate record of the country and its inhabitants in continuation of the information now collected and recorded by the Settlement Department at the time of settlement.

(3) The analysis of the Presidency, district by district, with reference to its requirements for irrigation and pasture.

(4) The organisation and education in conjunction with district officers of the staff of revenue inspectors, through whom all agricultural information is to be collected for Government, and agricultural improvements brought to the notice of the ryot.

(5) The organisation of the arrangements required to carry into effect such of the provisions of the proposed irrigation law as may involve the utilisation of communal labor.

(6) The preparation of agricultural reports and the arrangement of schemes for famine relief of an agricultural character.

The points now under inquiry more specifically relate only to the first half of the sixth item.

31. When the department was organised, it was arranged that the Director should be an additional Member of the Board of Revenue; an arrangement which was continued till April 1885, but was not again revived, except as a temporary measure until the reorganisation of the Board in April 1887, when the department was merged in the Board of Revenue and placed in charge of one of the Commissioners.

32. As already shown, when the department was organised, there existed a regular staff for the conduct of experimental inquiry, and for agricultural education in connection with the farm at Saidápet, which was used for both purposes. The officer in charge of the farm and of the School of Agriculture was at that time also appointed to be Agricultural Reporter to Government, whose chief function was to be "the study of the agricultural conditions of the different districts of the Presidency and the proposal of measures to remedy such defects as they may present." This officer was subordinate to the Director of the Department as regards his work as Superintendent of Govern-

ment Farms and Agricultural Reporter, and held charge of the School of Agriculture under control of the Director of Public Instruction. These arrangements were soon found to be unsatisfactory and during the year 1883 were under discussion, leading to the entire severance of the farm at Saidápet from the agricultural college, separate officers being appointed in April 1884 to be—

G.O., dated 7th Jan. 1884, No. 3, Revenue.

(1) Principal of the College; and
(2) Agricultural Reporter and Superintendent of Government Farms.

33. In view of these changes, the Government of India desired to be informed on what lines it was intended that the agricultural policy of the Presidency should proceed, and the Director of the Department, in response to a call from the Government for an expression of his views on the subject, gave it as his opinion that the agricultural policy of the Government should be a policy having for its main aim the prevention of famine. The chief means for the attainment of this end, he described as "wood, water and roads *;" terms which he expanded and explained as follows:—

"By wood, I mean, the forest in its widest signification. As now and hereafter to be administered, the forests will give to the agriculturist fuel and fodder: the refuse of his farm-yard need no longer be burnt for want of other fuel; he can return it to the soil: his cattle will, it is hoped, find in the reserves some food even in the severest droughts, while the influence of the forest on rainfall, dew and the regulation of surface drainage connot be overlooked.

"Water is, in this Presidency, largely necessary to the possibility even of cultivation and anything that tends to increase the supply directly tends to the stability of agriculture. The maintenance and extension, therefore, of irrigation, wherever, by whatever means and in whatever mode it may be possible, and whether by the direct action of Government or indirectly by its removal when it can remove them of all obstacles to the extension of irrigation by private enterprise, is a subject which must ever have a foremost place in the consideration of this Government.

"Wood and water influence chiefly perhaps the stability of agriculture; roads tend mainly to increase of production.. By roads, I mean every means of communication, by whatever name, road, railway, tramway or canal, they may be called. New and wider markets are by them opened to produce and the increased demand which is thus created tends at once to the extension of the absolute area of cultivation and to the intensive cultivation of lands already under tillage. The necessity of extending and rapidly extending the railway communications, especially of this Presidency, cannot be too strongly insisted upon."

In reference to the farm at Saidápet, the Director wrote that "having regard to its influence on the general agriculture of the country, he did not think it could be regarded as a success in the past or should be maintained in the future." He recommended its abolition and deprecated its replacement either then or at any future time, without very full inquiry, by any other Government farm. Any experiments that the Government might wish to make could indeed be specially provided for and he suggested that for the conduct of them the good offices of native agriculturists might in many cases be available. "For the improvement of the agriculture of the country," he pointed out, "we must know first wherein the ryots' methods are defective before we can hope to remedy them." He recommended, therefore, that "for the present and for some time to come Mr. Benson should as Agricultural Reporter be employed, in the words of paragraph 7 of G.O., Nos. 350 and 351A, dated the 29th March 1882, on the study of the agricultural systems of the various districts of the Presidency in view to his preparing an analysis of their condition and requirements from the standpoint of an expert."

Various other suggestions were made by the Board of Revenue and the Director of Public Instruction, but were not accepted by Government, which considered the suggestions of the Director sufficient to form the basis of a practical policy for the immediate future as far as the work of the Agricultural Department itself was concerned. It was decided, therefore—

G.O., dated 16th February 1885, No. 194.

(1) to abandon the Saidápet farm;
(2) to institute no more farms, but to carry out experiments with the aid of private individuals; and
(3) to make a careful study of native agriculture;

* The department has at present nothing to do with the administration of forests or irrigation works.

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a small staff of inspectors being provided for the last purpose, and a small *annexe* of land from the Saidápet farm being handed over to the College for educational purposes.

The chief agricultural work of the department was, therefore, to be that indicated as the duty of the Agricultural Reporter in 1882. The post of Agricultural Reporter was abolished in 1885, and the position of the officer in charge of the work formerly devolving on that officer more clearly indicated by his being appointed Assistant Director of Agriculture. The Saidápet Experimental Farm was closed as such in September 1885, but it remained in charge of the department, as a depôt for stock, until September 1886, when the land set aside as an *annexe* for the college was finally transferred.

G.O., dated 24th August 1885, No. 959.

34. The work previously done in the study of native agriculture has already been alluded to; but it was only in 1885 that this study was taken up systematically, and a scheme for an agricultural survey having been approved of by the Director, operations were commenced in the Kurnool district in September of that year, but the staff of agricultural inspectors could not be provided then nor were any appointed until the year 1886-87, when their field work began with the cultivating season of that year. In the meanwhile much discussion arose around the system to be pursued in these surveys, but it was finally decided, in December 1887, that the preparation of the famine analyses and the agricultural survey of districts should be combined and the duty of preparing them entrusted to the Assistant Director of the Department; that the tractwar plan should only be carried out in Kurnool; and that permanent village registers should be prepared and the analysis worked up from them in the future, for other districts. This system has been begun in Cuddapah, and the work demands nearly the whole of the time of the Assistant Director and of the seven agricultural inspectors employed under the department.

Proceedings, No. 1380-A, dated 24th July 1885.
" " 1557 " 19th Aug. "

G.O., dated 20th October 1885, No. 1171.
" " 25th June 1886 " 528.
" " 24th March 1887 " 319.
" " 12th Dec. " " 1141.

It is thus evident that most of the strength of the department, on its purely agricultural side, is devoted to what the Government of India in 1881 pointed out to be the primary object of all Agricultural Departments, namely, inquiry; in this carrying out the third particular of the policy of the Madras Government, as declared in 1885.

35. How the first particular of that policy has been carried out has already been shown, and, as regards the second, it may be noted that shortly after the issue of the order setting forth this policy, the Director submitted certain proposals for conducting experiments for the introduction of more diversified cropping in tracts now confined to the growth of paddy, and for improving the curing of tobacco, which were approved of by Government. The diversified cropping experiments were to be carried out by private agency and those in tobacco-curing by the aid of a professional curer. In another resolution passed towards the latter end of 1884, the Government had expressed the opinion that more active operations should be undertaken towards the improvement of farm stock (which resolve led to the formation of the stock depôt at Hosúr), and in October 1883 had purchased an Arab stallion for use in the Madura district, which led to the present development of pony-breeding operations. These, with a few other minor matters, will be referred to more fully below, and belong to what was termed the secondary object of the Agricultural Departments, in 1881; namely, agricultural improvement, which is the matter to which the inquiry now proceeding is specially directed. This object was, the Government of India then pointed out, to be held in abeyance until the department had been securely organised and the first object of its existence well developed.

G.O., dated 2nd May 1885, No. 513.

36. The work carried out by the department will now be more fully detailed with reference to the foregoing remarks.

Diversified cropping.—The experiments made at Saidápet to determine the economic quantity of water required for raising a crop of paddy have already been alluded to, but further experiments have not yet been set on foot on account of the difficulties in securing suitable ground, expense and supervision.

The tobacco-curing experiments have only just been begun, as the professional curer has only recently arrived in the Presidency to commence operations.

Stock-breeding.—The necessity for improving the indigenous breeds of live-stock was alluded to by Sir William Denison in his minute of October 1863, and what was done at Saidápet, whilst the farm existed there, has already been mentioned; but what is being done at present dates from the remarks of Government in December 1884, in reference to the annual report of the previous year, that "Mr. Benson's remark that rams should be distributed, not by tens or dozens per annum, but by hundreds to do much good is, therefore, strictly to the point, and the Government do not doubt that, if the course he suggests could be adopted in any one district very perceptible benefit would result in no long period of time." It was at once pointed out that "for the object desired, Government must be prepared to spend largely or it could not be accomplished," and later on the Government called for the Director's proposals for starting a stock-breeding farm and the whole matter was discussed and the general lines laid down early in 1886, when the Government decided that it was undesirable to attempt the establishment of a *breeding* farm, but approved of a scheme under which good young stud bulls should be purchased, and, after being kept at a depôt till they were fit for work, should be sent out for stud purposes into certain districts. Difficulties then arose in selecting a suitable site for the depôt, but finally one was selected and secured near Hosúr and the system and policy to be pursued in the management of it finally worked out in 1887 and a tentative detailed scheme drawn up and approved of generally. Everything was estimated for on the smallest possible scale in order to keep the charges within the funds then available, and a few small buildings were erected. The depôt was ready for the reception of some of the stock belonging to the department, previously kept at Saidápet, in December 1887, and this was then moved to Hosúr. A few purchases were made during the remainder of the year 1887-88, and during the past six months a few bulls and rams have been sent out, and it was intended to make the operations of the depôt more effective, when orders were received to stop all further action. So far the depôt has never been fully organized, nor has its work been set on a proper footing.

G.O., dated 19th December 1884, No. 1412.

Director's letter, 10th April 1885, No. 567, in G.O., dated 11th May 1885, No. 547.

G.O., dated 13th January 1886, No. 31.

G.O., dated 20th May 1887, No. 495, and 25th November 1887, No. 1103.

G.O., dated 7th June 1888, No. 386.
" " 11th September 1888, No. 647.

Pony-breeding.—A complete *résumé* of the pony and mule breeding operations conducted in the Presidency has been printed so that it is not necessary to enter on details here.

The introduction of improved implements and machines.—The early efforts in this direction have already been alluded to. Ploughing matches were frequently held amongst the farm laborers at Saidápet for the encouragement of good workmanship, and in 1872 a public match was held. These matches do not appear to have been regularly held in later years until 1879, but after that date, until 1885, regular annual matches were held at or near Saidápet. It was proposed in 1884 that these

matches should be extended to the districts, but only one was so held, viz., that at Kurnool towards the end of 1885, and since then ploughing matches have been abandoned and a system of demonstrations with agricultural implements and machines has been organized. The first attempt at such a demonstration was made in the Trichinopoly district in 1879, but was then a failure, owing to the want of a proper appreciation of the needs and ideas of the ryot. In 1885, a student of the Agricultural college with some assistance from the department conducted a successful demonstration in the Tinnevelly district, which led up in the following year to a regular travelling show being organized by the department and sent to travel through parts of the Southern districts. This show was repeated in the following and in the current year, the shows in both cases going over almost entirely new ground. Prior to these shows, a good deal had been done by lending ploughs and sending out ploughmen to work under district officers, notably in the case of the Swedish ploughs imported in 1882, and that system has been continued to some extent through the assistance afforded by manufacturing firms in Madras. In view to the difficulties experienced by ryots in repairing ploughs, &c., a few blacksmiths were at various times sent down to Saidápet to be trained, and later on arrangements were made with Messrs. Massey and Co. for the same purpose; but the latter arrangement has not been availed of.

G.O., dated 28th April 1884, No. 555.

" " 11th December 1886, No. 1082.

" " 7th July 1879, No. 1424.

Attention having been drawn to the fact that the bamboo seed-drill of the Telugu country is not known or used in the Southern districts, specimens of it have been made and sent for exhibition to several districts, but not so far with much result.

In 1881 attention was drawn to the marked inferiority of the sugar-cane mill worked on the banks of the Tungabhadra to the Beheea Mill, and the Government ordered one of the latter to be sent to Bellary for trial. This was done and the trials, though not completely satisfactory, were very favorable to the new mill, and they led to further experiments being made in the district during the following year with a larger and stronger mill with which the results were so satisfactory that a brisk demand sprang up for the mills locally, and firstly Messrs. Oakes and Co., and later on a local agent undertook the supply of them; the demand for which continues. The same mill has been exhibited in a good many other places, and it, or patterns very similar to it, are coming into very general use in many parts of the Presidency.

G.O., dated 13th July 1881, No. 1067.

G.O., dated 29th July 1882, No. 794.

37. Amongst other minor matters which have received the attention of the department have been:—

The distribution of exotic seeds, a practice which has been going on in the Presidency for the last twenty years, during which time large quantities of the seeds noted on the margin have been distributed through the ordinary official agency and experimented with. The results of these experiments have been from various causes so inadequate and unsatisfactory that the practice has been almost entirely given up, except in special cases. Since the department was organized, the chief plants, seeds of which have been distributed for special purposes, have been—

Carolina paddy.
New Orleans cotton.
Tobacco.
Maize.
Sorghum.
&c., &c.

1. The salt bush ...	Fodder plant	Result, failure.
2. Eucalyptus ...	Wood and fuel producers and preventers of fever.	Result indeterminate as yet.
3. Edible cactus ...	Fodder and food plant ...	Result indeterminate.
4. Wheat on the Nilgiris.	Improved cereal	Results, failure.
5. Barley do. ...	For brewing	Result, success and operation repeated.

The study of hitherto unutilized economic products has also received some attention; amongst these may be named—

1. Divi Divi	Large quantities of seed distributed.	Now to be seen growing in many places.
2. Babul bark ...	Consignment shipped, to be tested for tanning purposes.	Found no market.
3. Sorghum sugar ...	Machinery imported for making and tried.	Failure to make sugar and further action dropped for the present.
4. Manilla hemp ...	Large numbers of plants distributed.	Found to grow freely in many places, but the difficulty of extracting fibre makes it almost useless.
5. Kolnar (*Helicteres Isora*).	Fibre investigated ...	Found unsuitable for weaving, though possibly useful for cordage.
6. Khaki cotton ...	Seeds distributed	Did not succeed, and in absence of anticipated demand, no further attempts made to grow it.
7. Japanese lacquer tree.	Do. do.	General failure to grow.
8. Mahogany trees ...	Plants distributed ...	Result indeterminate.
9. Date palm ...	Do. do. ...	Do. do.

Sericulture—both with the China and the tassar silk worm, has received attention. Several experiments made in different places with the former showed that there was no difficulty in rearing the silk worms in the plains, where food could be obtained, but difficulty arose in preserving eggs from one season to another. More attention has been devoted during the last two years to the economic production of tassar silk, and an officer has recently been appointed to collect and prepare cocoons for winding in the Chingleput district. It is yet too early to forecast any results.

Ensilage.—Numerous experiments have been made by different selected officers throughout the country on the process of ensilage with a fair measure of success, but much remains for further investigation and experiments are still proceeding.

B.P., No. 209, dated 9th May 1888; G.O., No. 452, dated 23rd June 1888.

38. *The encouragement of private enterprise.*—In their orders of December 1881, the Government of India pointed out the necessity for agricultural departments working through the agency of native agriculturists. In this Presidency, the only work done in this direction that can be alluded to is the following. A wealthy mirasidar of Shiyáli in the Tanjore district having for several years persistently devoted his time and energies to the introduction of improvements on his estate, the Government in 1885 resolved to award him a gold medal as a mark of their appreciation of his enterprise, and on subsequent occasions recorded their pleasure and approval of his efforts. Unfortunately that gentleman has since died. A merchant of Bellary, who takes a great interest in the cotton trade, took a large block of land in hand in that district and his operations were the matter for a special report in 1883, but it is not known whether he continues his experiments. In 1884, the Reverend H. Little, of Karúr, applied to the department for assistance in founding an agricultural colony on some land he had acquired near Karúr, with a view to making it a centre for the dissemination of new ideas. It was not possible for Government to grant all the requests made, and rather than accept those offered on the conditions laid down they were rejected. The department only gave some assistance in the way of stock and implements.

G.O., dated 19th June 1883, No. 748.

In the same year, the Collector of Madura applied for help towards a farm then recently started at Madura by a committee of native gentlemen and the Government sanctioned the grant of the salary for a Superintendent for three years on condition that the Director could give a satisfactory report on the farm at the end of each year, and also granted some stock. This farm is still in existence, but the future policy to be pursued regarding it is under discussion and consideration by Government.

G.O., dated 17th April 1888, No. 2269.

The ephemeral existence of the farm started at Chittoor has been noted. An Agri-Horticultural society formed at Narsapur a few years ago obtained the promise of a grant of land on certain conditions, but nothing is known of it at present. And at Tinnevelly, an agricultural association exists which has been manufacturing ploughs for sale to the ryots and attempting the introduction of seeds of new or improved varieties of plants. The means of the society are believed to be small and its existence precarious.

The Madras Agri-Horticultural Society, founded in 1835, has always received some aid from Government in return for assistance in promoting agricultural improvement. In 1854, the Government in reviewing what the society had done noticed it unfavorably. In 1869 the society put forth a statement of what had been effected by it during its existence. At that time it received a grant of Rs. 3,000 from the Government, as well as a special grant annually to enable it to make the annual show somewhat agricultural. In 1873 the Government of India inquired into the working of the society and after pointing out that the usual grants were intended specially to encourage operations towards the advancement of agriculture and horticulture amongst the native population sanctioned the continuance of the grants. The work of the society was reviewed again in 1879 and in 1883, and after the date last named, the annual grant was raised to Rs. 4,000, and the close co-operation of the newly-formed Agricultural Department with the society was urged. The grant is not made from funds allotted to the department and the co-operation of the department and the society is very limited. The Secretary's letter, written in reply to an invitation from the department for co-operation, will explain why.

G.O., dated 21st December 1869, No. 3223.

G.O., dated 12th January 1874, No. 43.

G.O., dated 26th September 1883, No. 1194.

39. *The Prevention of Cattle Disease.*—The history of the efforts of Government in this direction, which led up to the formation of the branch of the department as now existing for that purpose, dates back to the years 1864-65, when the prevalence of cattle diseases in Kurnool and on the Hills attracted attention, and Mr. Thacker, V.S., was deputed to investigate their nature and ascertain the most suitable mode of preventing and curing them. On the cessation of disease on the Hills, Mr. Thacker proceeded to Coimbatore, and it was then suggested that he should continue his investigations, and the Government resolved to employ him for that purpose on a fixed salary in future, his previous work having been rewarded by special *douceurs.* Mr. Thacker appears to have furnished half-yearly reports subsequently on his operations and in the following year, the Government were so satisfied with the results that they resolved that his continued employment was desirable 'as calculated to produce very valuable results to the agricultural class,' and desired him to prepare a simple manual, regarding the symptoms and treatment of the different forms of disease met with. The continued employment of Mr. Thacker in dealing with cattle disease was approved of by the Secretary of State, and with only brief interruptions he remained on this duty until early in 1871, when he proceeded to England. The manual was published and widely distributed.

B.P., dated 2nd March 1866, No. 1453.

G.O., „ 23rd April „ „ 957.

G.O., dated 12th November 1867, No. 2667.

G.O., dated 24th April 1868, No. 1118.

In 1866, it was thought necessary to legislate to compel the ryots to adopt the remedial measures prescribed by Mr. Thacker as their apathy and recklessness proved a serious obstacle to the prevention of the spread of disease, but the Act was not brought into force and it was not long before it was criticised and its amendment suggested, but it was not then considered necessary to amend it or to introduce any similar enactment.

Act II of 1866.

G.O., dated 24th June 1869, No. 1790.

40. In 1870, the Board proposed that a School of Veterinary Surgery should be established and that carefully trained men should be appointed to each district to continue Mr. Thacker's work, and a scheme for that purpose was prepared by them. This involved the re-entertainment of Mr. Thacker, the appointment of twenty-six cattle doctors to work under him, and the starting of a training school. These cattle doctors were to be engaged on the improvement of breeds of horses, cattle and sheep, the cure of diseases, the collection of information as to fodder, &c., and the wide dissemination of more enlightened views on all these subjects. This, however, the Government did not accept, as they considered that the scheme would involve a heavy expenditure, without any equivalent results. They considered that the advice and instructions of Mr. Thacker, which were widely circulated, sufficed for the guidance of cattle-owners and that the proposed cattle doctors would not have the confidence of, nor any influence with the people in regard to the treatment of disease, and would be powerless as to the other matters alluded to by the Board. They finally condemned the scheme as premature, although they thought a time might come for the intervention of Government by "way of affording means of study, but not of making the veterinary profession a Government Department." The Secretary of State concurred in the remarks of the Government regarding the Board's scheme, but hoped that Mr. Thacker's services would not be dispensed with, but it does not appear that anything further was done in that matter for some years. In 1873, the Board again brought forward the question of the employment of a special veterinary officer for the Presidency, and the Government, after some discussion of the question, resolved to apply to the Home Government for such an officer, but before doing this, applied to the Military Department for the services of a Veterinary Surgeon, who was already acquainted with the country and the language and inured to the climate. This resulted in the appointment of Mr. G. Western, V.S., as Inspector of Cattle Diseases in March 1875, which post he continued to fill until January 1876 only. He submitted a report on his work in which he showed that, in spite of all that had been done in Mr. Thacker's time, no permanent improvement had taken place in the treatment of their sick cattle by the ryots, if left to themselves, and urged the application of Act II of 1866 in cases of the outbreak of disease, and the appointment of a small staff of trained assistants to the Inspector, who might, he thought, be selected from the students of the School of Agriculture, then about to be established.

G.O., dated 13th July 1871, No. 1209.

G.O., dated 23rd September 1874, No. 1205.

G.O., dated 15th December 1874, No. 1560.

G.O., dated 15th June 1876, No. 805.

41. When Mr. Western returned to Military duty, the Board recommended that he should still be retained as their professional adviser in reference to cattle diseases, but the Government did not consider that this arrangement would serve any good purpose, and instructed the Board to submit an exact statement of the terms they would propose for a Veterinary Surgeon whom the Government would take steps to procure from England. The salary approved of was Rs. 300, rising to Rs. 500 a month in four years, but the Secretary of State intimated that no Veterinary Surgeon was procurable for double that rate, and the Board suggested that they might advertise in India for one, to which proposal the Government consented and fixed the pay to be offered at Rs. 600 a month. This advertisement failed to bring in any applications, and the Board then suggested a further application to England, if no Veterinary Surgeon could be spared from the Military Department, but the Government resolved to make inquiries whether a suitable man might not be obtained in France or Germany, no officer of the Military Department being likely to be available.

G.O., dated 25th April 1876, No. 544.

G.O., dated 21st July 1876, No. 985.

G.O., dated 30th November 1876, No. 1865.

" " 15th February 1877, " 671.

G.O., dated 7th July 1877, No. 2244.

42. In 1877, a revised edition of Thacker's manual was published, with which was incorporated extracts from Mr. Hallen's book.

43. The question of appointing an Inspector of Cattle Diseases rested from 1877 until the year 1881, when the urgency of appointing a Veterinary officer as Inspector of Cattle Diseases was again brought to notice by the Board, and, as a temporary arrangement, Mr. J. Hammond, V.S., was placed on special duty in the Chingleput District as Inspector of Cattle Diseases. He only remained on this duty for a few months in that year.

G.O., dated 9th June 1881, No. 901.

Whilst this arrangement was in force, a further resolution of Government was issued, in which they observed that "the employment of a permanent Cattle Disease Inspector in this Presidency is of the most pressing importance," and that "the health of cattle is a primary necessity in an agricultural country," and they decided that it was desirable to put the system of imparting a knowledge of the veterinary art, and the operations for dealing with disease on a more permanent footing, for which purpose they desired to obtain the services of a competent teacher for the School of Agriculture who, if he possessed Indian experience, might also officiate as Inspector of Cattle Diseases. They, therefore, authorised the Board to advertise in the Indian papers for such a person. The result of this advertisement was the selection of Mr. Shunker, from a number of applicants, as being a highly recommended and experienced man, to fill the post of itinerant Cattle Disease Inspector on a salary of Rs. 300, with duties entirely separate from those of the Lecturer on Veterinary Surgery at the Agricultural College, which duties Mr. Western continued to discharge.

G.O., dated 9th June 1881, No. 901.
" " 12th December " " 1917.

At the same time, the Government sanctioned the immediate introduction of a scheme, which had been prepared in 1878 by Messrs. Robertson and Western, for the formation of a staff of local Cattle Disease Inspectors, but which had then been ordered to lie over, pending the settlement of other questions connected with agricultural education. This scheme provided that, annually for three years, nine probationers should be selected from those students who had passed through a full agricultural course at Saidápet, a point to which Messrs. Robertson and Western both attached importance, and it was hoped in this way to provide a sufficient staff to allow of one Inspector being posted to each district of the Presidency. The training was to be carried out partly in the districts where contagious disease prevailed, and partly at the Veterinary hospital attached to the School of Agriculture.

G.O., dated 18th October 1878, No. 1844.

Soon after, however, Mr. Western was obliged to leave India, and his appointment as Veterinary lecturer at the School of Agriculture was filled up temporarily by Mr. J. Mills, V.S., then doing duty at St. Thomas' Mount. This arrangement was not satisfactory to the Military authorities, and on the recommendation of the Board, Mr. Mills was soon after appointed to the combined offices of Veterinary Lecturer and Inspector of Cattle Diseases (his services being placed at the disposal of the Revenue Department for that purpose) on a salary of Rs. 650, including Rs. 50 as house rent. This appointment led to an alteration of the name of the post to which Mr. Shunker had been appointed. He was made Deputy Inspector under Mr. Mills. These arrangements were sanctioned by the Secretary of State for three years, during which period it was hoped that a better organisation would be evolved.

G.O., dated 19th August 1882, No. 873.
" " 7th September " " 2940.

G.O., dated 2nd October 1882, No. 1053.
" " 6th August 1883, " 947.

44. Soon after these arrangements had been made, the Inspector of Cattle Diseases was placed under the orders of the newly appointed Director of Agriculture,

and early in 1883, Mr. Mills was placed in charge of mule-breeding operations, which charge, however, did not last long, as the operations were discontinued towards the end of the year. The head-quarters of the Inspector were at this time fixed at the Mount, and it was resolved that the cost of medicines used of treating cattle disease in the mofussil should be met from the agricultural budget. During the same year rules for the Veterinary School in connection with the Veterinary hospital at Saidápet, which had been placed in charge of the Inspector of Cattle Diseases, and for the guidance of local Cattle Disease Inspectors were framed and approved. The Collectors of districts were appointed controlling officers of these local Inspectors and arrangements were made for sending out the probationers into the districts both for training, and to render assistance in the repression of disease, Mr. Mills at that time considering the class of men obtained to be most promising, except as regards their timidity in handling animals.

G.O., dated 17th January 1883, No. 74.
" " 7th March " " 1474.
" " 8th Nov. " " 1376.
" " 11th June " " 719.
" " 11th July " " 857.

G.O., dated 8th November 1883, No. 1374.
" " 13th October " " 1283.
" " 27th February " " 289.

45. In 1883, Mr. Mills undertook to rewrite Messrs. Thacker and Hallen's "Manual of the more deadly forms of Cattle Disease in India," and his revision of it was published under the name of "Plain Hints on Cattle Disease"; translations of which in Tamil and Telugu have also been published, under the name of "Stock-owners Guide." He also wrote a pamphlet "Cinerators and Sanitation," copies of which were purchased by the Government for distribution to all Revenue officers down to the grade of Deputy Tahsildar.

G.O., dated 10th April 1883, No. 429.

G.O., dated 19th April 1883, No. 481.

46. It was not until the year 1884-85 that the Inspector of Cattle Diseases visited any of the districts, but his Deputy was constantly itinerating. In that year he was granted an Assistant at the Agricultural College to relieve him of part of the educational work, but he was only able to leave the college during vacations. This arrangement continued during the following year, during which the Secretary of State sanctioned the continuance of the appointment for another two years on a salary of Rs. 800 consolidated; but the house-rent also was continued. In 1886-87, however, the Government insisted on half of the year being given up to inspection and the Inspector of Cattle Diseases was on tour for the latter part of the year. The Deputy Inspector, however, had been practically taken off the staff in July 1886, and placed in charge of pony-breeding operations in Coimbatore and Salem under the orders of the Collectors. Early in the year 1887-88, Mr. Mills went on leave to Europe, and no one was appointed to the post until the end of February 1888, when the present incumbent joined the department. Until the year 1886-87, most of the Inspector's time was taken up as a lecturer at Saidápet and in teaching his probationers and he could only exercise a general supervision over the local Inspectors in the mofussil. The present Inspector has nothing to do with educational work at Saidápet.

G.O., dated 10th August 1885, No. 415.

G.O., dated 1st July 1886, No. 3881.

47. The recruitment of the local Cattle Disease Inspectors was begun in 1882, and at the end of that official year there were nine probationers under training. A year later, six Inspectors had been posted to districts, two years later 14, three years later 17, and four years later 18, whilst in the last year referred to (1886-87), there were only two probationers under training, and a year later the total strength was only 17 local or Stock Inspectors, as they are now called. It was not found possible to keep the class of probationers up to its full strength in the third year and its continuance for another year was sanctioned in 1885, and a year later the continued want of recruits led to further proposals for

G.O., dated 14th September 1885, No. 1041.

the maintenance of the special class and a discussion of the best means of providing recruits, upon which the Government decided to establish two annual scholarships at the School of Agriculture for veterinary students, which, it was hoped, would turn out a sufficient supply of competent men, and in order to provide for immediate requirements, the system of training probationers was to be continued until the new system had been fully introduced. The Government at the same time suggested that cow-doctors of the ryot class might earn satisfactorily incomes, and that they might be taught gratuitously in Madras by one of the Stock Inspectors.

G.O., dated 3rd November 1887, No. 1027.

Considerable difficulty has been experienced in recruiting the probationers, and adequate training for a veterinary class at Saidápet not being forthcoming and it being doubtful whether the training in the Bombay veterinary hospital is entirely suitable, the matter of future recruitment has been allowed to lie over pending the orders of the Government of India on the proposed constitution of a Civil Veterinary Department and a veterinary training school.

Board's Proceedings, dated 19th June 1888, No. 285, and 2nd August 1888, No. 384.

The suggestion of Government that a class of cow-doctors should be trained by one of the Stock Inspectors was reported on by the Board, who pointed out that such men would not be able to earn a living, but as it appeared that the proposals of Government had not been well understood, the matter has been referred for further report to the present Inspector of Cattle Diseases, who has not yet finally replied.

G.O., dated 30th May 1888, No. 371.

Guided by the experience of earlier years, a new set of rules for the guidance of Stock Inspectors was framed early in the current year, which clearly define their position and duties. They are primarily responsible to the Collectors of their districts, who control their movements, and it is the duty of the Inspector of Cattle Diseases to supervise and guide them in their professional work, and to bring to notice any irregularity in their conduct that he may discover.

G.O., dated 14th February 1888, No. 147.

48. As has already been noted, Act II of 1866 was not put in force for many years after it was passed. A full report on the working of it up to that date was submitted in 1885, in reply to a reference from the Government of India, who soon after decided that the question of legislative action for the suppression of cattle disease should be held in abeyance. In the meanwhile, the Act has been introduced in several districts or parts of districts and the working of it is at present under inquiry, whilst several suggestions have been made for its amendment and modification. The chief difficulty in the way of working the Act at present is the want of an adequately qualified agency to take charge of hospitals and to treat animals.

G.O., dated 13th April 1885, No. 431.

G.O., No. 1003, dated 18th November 1886.

Board's Proceedings, dated 25th September 1887, No. 528.

49. Attention having been drawn to M. Pasteur's system of protective inoculation for anthrax, Mr. Mills made a number of experiments with vaccine obtained from Paris during the years 1885-86, and in 1887, in reply to a reference of the Government of India, the Government expressed the opinion that as exact bacteriological study requires both a specialist and time for consecutive labor, a laboratory might be established at Madras or Saidápet under one of M. Pasteur's agents in conjunction with whom a special veterinary or medical officer might be deputed to superintend the conduct of experiments on a thorough scale, the future enlargement of the sphere of operations being left to form itself on the fruits of their practical experience.

G.O., dated 7th December 1883, No. 1528.

50. In conclusion mention must be made of the duties of the officers at present employed in the department. These are—

(*a*) The Assistant Director, who is for all practical purposes a Joint Secretary to the Commissioner in the Department of Land Records and Agriculture, and has besides the work which falls to him in that position—

(1) charge of all famine analysis work;
(2) charge of the stock depôt;
(3) supervision of travelling shows;
(4) to assist as special adviser to the Collectors at mofussil shows;
(5) to act as referee on all matters agricultural;
(6) to perform any agricultural work in the department which may be necessary from time to time, as the Director orders.

(*b*) The Inspector of Cattle Diseases, who—

(1) is the veterinary adviser of the Director;
(2) has to supervise and direct the work of the Stock Inspectors; and
(3) to train probationers for their posts.

(*c*) The Deputy Inspector of Cattle Diseases, who—

(1) is in charge of pony-breeding operations, under the orders of the Collectors of Salem, Coimbatore and Nílgiris;
(2) occasionally assists in work connected with the stock depôt.

(*d*) The Sub-Assistant Director of Agriculture, who is practically an assistant to the Inspector of Cattle Diseases, but is available for agricultural work on special occasions.

(*e*) The Agricultural Inspectors (7), who are employed almost solely in connection with the preparation of famine analyses, but may be deputed to such work as—

(1) charge of travelling shows;
(2) supervision of special experiments with seeds, such as the barley experiments on Nílgiris;
(3) to assist at mofussil exhibitions.

(*f*) The Stock Inspectors—Nominal strength 23. Actual. { Inspectors (17). Probationers (5). } who are allotted one to each district for cattle disease prevention work, under the orders and control of the Collectors. They are also held responsible for looking after any stud bulls, &c., sent out by the department, and it is intended to utilise them, if possible, in pony-breeding and castrating operations.

In 1887, it was proposed to combine the functions of the superior officers of both branches so as to allow of better results being obtained with the small staff which it is at present possible to employ, but the only change made was the appointment of the Sub-Assistant Director, and the staff stands as noted above.

G.O., dated 10th January 1888, No. 14.

15th December 1888. (Signed) C. BENSON, M.R.A.C.

APPENDIX C.

PRELIMINARY NOTE.

An abstract of the history of departmental operations will be found in Mr. Benson's printed Note Appendix B. The present summary is intended to set out for discussion the facts and suggestions discoverable in the papers at present available.

2. The origin of the department is due to the recognition by Government of the necessity for agricultural improvement and the duty of Government in promoting it. In 1854 the Court of Directors laid down in their Educational Despatch the dictum that "no single advantage could be afforded to the vast rural population of India that would equal the introduction of an improved system of agriculture." Nothing tangible was done, however, till the famines of the following decade aroused attention, when Lord Mayo, as Viceroy, declared in 1870 that Indian agriculture is in a primitive and backward condition and that Government had not done for its improvement all it might have done; that it could not be doubted that when the light of science has been properly brought to bear upon Indian agriculture, the results will be as great as they are in Europe; that the duties which in England are performed by a good landlord, fall in India in a great measure upon the Government; that the only Indian landlord who can command the requisite knowledge and capital for the improvement of the land is the State; that there is perhaps no country in the world in which the State has so immediate and direct an interest in such questions; and that the work that is performed by the great agricultural societies of Europe must be performed in India by the Government or not at all. The Secretary of State endorsed this view, saying "it is certain that the Government has a direct and immediate interest in the improvement of agriculture which is possessed by no Government in Europe." The Government of Madras was beforehand in recognizing these duties, observing (1865) that "in this Presidency the Government are in fact very much in the position of landlords, and reaping the benefits of the position, cannot ignore its obligations," viz., the advancement of agriculture as an object of the highest consequence, a view endorsed by the Secretary of State who relied "on a continuance of this interest in a question so closely allied to the welfare of the people." The importance of the subject is also mentioned *passim* in the orders and discussions of many years, and among the most prominent declarations is that of the Famine Commission, which points to the stimulation of agricultural progress as one of the most important needs of these times.

G.O., dated 20th March 1865, No. 680.

3. With these specific declarations of duty and interest, it is needless at present to do more than allude to the prominent position taken in the direct advancement of agriculture by the Governments of the European continent where the interests of Government are, in the words of the Secretary of State, less than those possessed by the Governments of India. It is well, however, to emphasize the above by a brief consideration of the present position. Since Lord Mayo wrote, there have been two disastrous famines, besides minor scarcities, while the ordinary material condition of large masses is such that there is for them no margin either of food production or food earning on which to fall back in cases of crop failure, while the food itself is of a coarse and not always wholesome description. The average cereal crop-yield all over is said to be about 11 bushels per acre as against more than 30—all cereals included—in England; millions of acres average 4 bushels or less, and often fail to return even the seed sown. The quantity of produce, whether of cereals, of pulse, or of cotton even on the famous black cotton soil, is so small as to suggest that the soils generally have descended to their "normal limit" of productiveness, *i.e.*, to the rate at which they may probably continue to yield a minimum produce without further diminution in ordinary years; a condition of the greatest danger

when it is general in a country of rapidly progressive and fairly dense population and of frequent drought. Not only so, but the whole external conditions of farming and the economic position of the country have altered and are altering with great rapidity. In old times a scanty population dwelt in villages shut off from the rest of the world by want of communications and by fiscal barriers, with a consequent absence of trade both foreign and internal; hence a system of self-sufficing farming and petty village industries, under which system there was little more than the mere local market for these goods; only the better soils were tilled, the remainder being left to grow wild field grass for common grazing; the simple village needs were supplied within the village, while any surplus, finding no external market, was stored for use in years of scarcity. Hence local custom became stereotyped almost into religious sentiment and the isolation of the ryot, both mental and industrial, became an almost impenetrable fence. But practically within a generation, certainly within 50 years, external conditions wholly changed; communications rapidly developed both by sea and land, so that an immense export trade, due to the low prices of Indian produce, and an equally vast internal trade have sprung up; hence the self-sufficing system is in a rapid transition to the system of farming for profit or trade; any surplus produce is easily exchangeable for silver which in turn is equally easily spent; population has enormously increased, both these causes operating to bring into tillage an immense area of the poorest possible lands: village industries have decreased with the opening up of foreign trade, so that larger numbers take to tilling the soil. Owing, moreover, to a rise in prices and an increase in population, a vast area is in tillage under the worst form of *métayage*, viz., a cultivation by paupers of land owned by men little above paupers and often rack-renting absentees, so that the land is cultivated with the least possible capital. Add to this the diminution in the size of farms owing to family sub-division, and the *morcellement* even of such farms, and grave difficulties are at once apparent. Meanwhile, the persistent cropping of the older lands and the export of all surplus produce cause deterioration of the anciently-cropped area, while the new area is treacherously uncertain in its capacity. The net result is a much larger population on a soil less productive per acre and more uncertain in yield by reason of its poverty, from which any surplus is carried permanently away, while the return in silver being easily obtained is often lightly spent. It will also be noticed that while a larger population makes greater demands on the soil for produce which is not appreciably returned to it, the export is taking away yearly vast quantities of its most irreplaceable soil constituents in the shape of wheat, oil-seeds, bones, &c., for which no corresponding equivalent is imported in the way of manure. This new external condition of farming, due to improved communications, is one of the most serious import, to which may be added the probable increase of cattle disease due to the same cause. While then communications may develop agriculture, they are probably also a cause of difficulty; any how they are potent factors in the change of conditions which has been produced more rapidly than the ryot can meet the change. Finally it may be noted that private effort is, in one way, growing less able to deal with adverse conditions, or to combat natural difficulties; the old communal organization has largely given way under the rapid influx of new ideas, new political, social, and economic conditions. Hence village or local combination for the execution of protective works, is daily growing more difficult, especially in the South; individual welfare and success are more and more becoming dependent on individual effort, while as yet the individual is not strong enough, or is insufficiently provided to meet the changes.

4. Of the remedies necessary, this Committee has only to consider those belonging to agricultural development, and it will be seen that if it was considered necessary in 1854, 1863 and 1870 that Government, as a beneficent landlord, should take up the subject of agricultural improvement, it is much more abundantly necessary in 1889, when all the conditions above noted have become intensified. For though a generation has sufficed to make these astonishing changes in the economic condition, it is far too short a period to have appreciable effect upon the practices or mental attitude of the ryot masses. Stereotyped custom, suspicious conservatism, and general ignorance cannot yield in a generation even though coupled with shrewd capacity in ancestrally-accepted methods; the ryot's mental perception is not quick enough to grasp the

facts, much less the reasons, of the new conditions, or the remedies necessary; it is not enough that a method be proved to be scientifically true or demonstrably necessary; it must be proved to the perception of the ryot; the real difficulty is to make him know. The remedy, moreover, does not lie merely in trade demands, or even in the pressure of population; it is necessary that the ryot should be guided, helped, taught and stimulated in agricultural improvements and advances of which at present he has no conception. In all countries the agriculturist—especially the petty proprietor—has moved with difficulty from his accustomed ways; *à fortiori* it will be difficult, if not impossible, for the Indian ryot, conservative by the education and isolation of centuries, to recognize and to adapt himself to his new and rapidly introduced conditions, unless aided and guided by powerful, suitable, and thoroughly trained agencies, whether technical or educational. For instance, there has for years been an insatiable external trade demand for *more* and *better* cotton; the ryot has responded to this demand,—even though it is backed by tangible silver results—, simply by the growth over an extended area of the old coarse cotton; the yield per acre is no more, but probably less, than it was in 1850, and the staple is no finer. Forty years ago the yield of clean cotton in Bellary, Cuddapah, Coimbatore, and Tinnevelly was 90, 50, 50, and 80 pounds per acre (Collectors' reports in Wheeler's Hand-book), while the present average even on good black cotton soil in those districts is not above 62½ pounds per acre. This, moreover, is the case, though in these districts, or, at least in the districts of Coimbatore and Tinnevelly, every available acre of black cotton soil has long been taken up, so that intensive cultivation leading to a higher and finer yield, more nearly approaching to the American average of from 250 to 350 pounds of clean and good cotton per acre, would here be found if such increase were possible under the methods and with the varieties known to the ryot. Similarly, the increase of population, which has nearly tripled within the century, has not led to any sufficient development in method; on the contrary, the extension which, except for some irrigational development, is practically the only resource known to the ryot, has led to the extensive taking up of bad soils—shallow, arid or saline—never before in general tillage, in dealing with which, therefore, the ryot has no experience to guide him. It was the failure over vast areas of poor and poorly tilled soil, probably at a minimum degree of productiveness, that intensified the recent famine. The ryot had not learnt—for he had none to teach him—that there are accessible methods which will greatly limit, and possibly counteract, the dangers from drought; he did not and does not know that there are crops—such as maize*—which will yield per acre twice as much as his best food-crops; he is ignorant that in countries where the population is of no greater density, and where the climate is more favorable to natural pastures, the ancient methods of cattle feeding once prevalent, viz., on wild pastures, has long ago been found insufficient, and that highly cultivated pastures and fodder-crops are found absolute necessities for the maintenance of good stock and the production of good manure. It is certain that the ryot's knowledge and customary resources are insufficient under new conditions, and that his ignorance of these new conditions, of his own inability—if unaided—to meet them, and of the remedies available, is a source of incalculable loss and danger to the State. Be it remembered that a different style of farming would probably double the ryot's present small average yield, as the yield has been doubled in England almost within a century, and as is declared possible for Ireland (Professor Baldwin) and for Italy (Beauclerk) by the simple application of more and more intelligently directed labor, of some small additional (and available) capital, and of accessible resources and methods; even the addition of *one* bushel per acre would pay the whole land revenue proper, and would feed the increment of population accruing through a whole decade. The economic conditions, moreover, are such that the extra bushels must be added and added quickly; the ryot must, if he would live and prosper, grow *intelligently* the most paying crop, in the best possible way, with the best outturn both in quantity and quality; it is not enough to grow customary crops in ancestral methods. Hence it is essential that the ryot should be *led* to discover the most suitable methods of the new agriculture and should obtain that open mind and intelligent receptivity

* Best garden crop of cholum = 800 Madras measures, say, 1 ton: best yield of maize (shelled), up to 115 bushels = nearly 3 tons, (Storer's Agriculture, 1889).

which will permit him to readily assimilate the demonstrable results of an enlarged experience. But since it is accepted that the ryot will not himself move in the matter, since he is not as the British farmer or the Swiss peasant, ever alive and anxious to seize the newest advantage, and since there are neither landlords nor great agricultural societies to experiment and to suggest, it is obvious that the work of agricultural reform "must be performed in India by the Government or not at all" (Lord Mayo in 1870); the work and subjects of research and experiment are so large, so costly, so complicated and require such complete continuity of inquiry, that only a Government department, well equipped for the purpose, can deal with them, while the means of communicating the results of such research and fostering local efforts in such wise that they may bear fruit, are at the disposal of Government alone, with whom also rest the establishment and development of such a system of education as will enable the ryot to appreciate the problem and to work out its solution.

5. Premising this much, it will be well to trace the recognition by Government of the duties it has freely acknowledged. In detailing the history of the department, it will be necessary to give a continuous account of its development from the mere model farm, leaving the work of the farm, agricultural education in general, and that of the college in particular, and the various minor branches to be separately discussed. Without such continuous history, the present position of the department, as an evolutionary development of the original simple idea, will be unintelligible.

6. In 1863, Sir William Denison drew the attention of Government to the state of agriculture, more especially as regards continuous cropping, deficient manure and its consumption as fuel owing to the want of trees, defective implements and cattle, and the want of accurate knowledge of agricultural statistics and facts. The other Members of Government considered that irrigation, communications, education, cheap justice, and careful assessment were the primary means of stimulating agriculture, but it was agreed that improved implements and the development of tree-growth were important adjuncts. A consignment of implements was indented for with the view of using them at the Remount Depôt at Hosúr. Meanwhile, the Collector of Madras suggested the advisability of starting a "Model farm" at Saidápet where Government lands were available. Government accepted the proposal partly with a view to demonstrate the value of the new implements to the satisfaction of the ryot and to remove native doubts as to advantages derivable from them, partly to test various manures, partly to exhibit "an improved system of agriculture," observing that the advancement of agriculture "is an object of the highest consequence," seeing that the land mainly supports the State revenue, and that the ryots hold the State lands as tenants of the State.

Papers in G.O., dated 6th November 1863, No. 1994.

G.O., dated 27th September 1864, No. 1784.
" " 28th March 1865, " 680.

7. A committee accordingly took charge of the farm which measured some 350 acres of land in bad condition, being a mere jungle, which required eradication and the remaking of the surface. After several vicissitudes, it was determined to appoint a proper superintendent, and Mr. Robertson accordingly arrived in November 1868; his immediate duties were those of Superintendent of the farm, but in 1869 he was ordered to review the reports and miscellaneous experiments made by district officers and to distribute seeds for experiments.

8. Meanwhile General Cotton had, in August 1868, pressed upon Government the necessity of a special department which should go into the subject "in all parts of the country" and should not be dependent upon the scanty leisure or casual half-hearted efforts of untrained persons, whether Collectors or their delegates. He pointed out the hopelessness of action when not guided by experts charged with the special duty of suiting implements and experiments to the wants of the country, and able to give advice and direct help. The Board found on inquiry a consensus of opinion that the status of agriculture should be raised and a general impetus given to its improvement; that the time had come for intervention and decided action by Govern-

Board's Proceedings, dated 23rd July 1870, No. 5013.

ment, and for the adoption of a system which should advance agricultural education, intelligence and knowledge, improve stock, develop the resources of the soil, and demonstrate *ad oculos* the advantages of improved processes. The Board consequently pressed the necessity for district model farms, with the establishment of an Agricultural school at Saidápet for training overseers and laborers for the proposed district farms, observing that desultory experiments were useless and dangerous and that much had yet to be learnt of the agricultural conditions of the country before applying European science to their improvement, so that study and experiment at model farms and careful observations were a necessity. The word "model" was here clearly intended to be "experimental." Government accepted *en bloc* the proposal for extending these operations, and ordered district model farms for the demonstration of improvements and for experiment in the marginally-noted matters. The farms, of about 200 acres each, were to be three at first, viz., Bellary, Coimbatore and Tinnevelly, and devoted not merely to general experiment, but to special research into the chief local crops; soil to be of fair average quality. These district farms were to be in general charge of Mr. Robertson, under the supervision of the Board, and in communication with the Collectors; the immediate charge was to be with a native superintendent to be paid from Rs. 150 to 250. These superintendents were to be obtained by selecting young men connected with landed property, or of the ryot class, and training them for three years at Saidápet. Funds were to be provided from the Surplus Pound Fund.

G.O., dated 22nd September 1871, No. 1657.

(1) To ascertain by experiment the proper use of rotation in crops in this country.
(2) To introduce the system of root or green crops in lieu of fallow without artificial irrigation.
(3) To introduce new crops.
(4) To provide new kinds of seed and fresh seed for the crops now cultivated.
(5) To make experiments in the use of water for the cultivation of crops now termed "dry" crops and for raising grasses and other crops to be used as fodder.
(6) To make experiments in the use of lime and other manures—mineral and animal.
(7) To introduce new and improved implements of rural labor.
(8) To improve the working cattle, sheep, horses and other varieties of live-stock in the country.

9. It will be seen therefore that so far the idea of the Saidápet farm scheme had developed into that of a central farm, with district farms both for local research and for the diffusion of information; the central farm was to be a place for training the district farm superintendents, and a general centre for getting and giving information, for the discussion of experiments and for the distribution of seeds; in other words, it was gradually assuming the functions of an agricultural and educational department. It is also apparent that the district farms were to be not model farms, but experimental, and were to supply that accurate knowledge of native methods and conditions which the Board admitted to be wanting. The weak point was that the chief superintendent himself had not been previously sent out to study minutely, as an expert, agricultural conditions and practices and the agricultural classes.

10. There was some difficulty in finding suitable candidates for training, and in 1872 and 1873, Mr. Robertson proposed to develop the central farm scheme. He pointed out that mere farm apprentices would never be able to do more than follow blindly what they had seen on the farm; that superintendents of district farms should be inquiring and observant men, ready to teach others and to explain the reasons for their methods; that they must be the local authorities and pioneers of progress, and as such must be most carefully trained scientifically so as to be skilled experimenters, able to vary processes according to need, while they must have wide and varied practical experience, or the farms would be useless or mischievous; that, of those trained at Saidápet, only a small percentage would ever be fit for such responsible posts, so that it would be necessary to have a larger selection under training; that the training should therefore be complete in agricultural and allied science as well as in the field, and followed by service as overseers in various farms

Dated 28th May 1872, No. 414.
„ 13th June 1873, „ 427.

so as to gain a knowledge of various branches; and that for the purpose of a wide selection as also for the diffusion of sound knowledge, the class of apprentices should be largely increased, the best men being selected as district farm superintendents, while the remainder would otherwise serve Government or private landlords. In other words, (1) district farm superintendents must be systematically trained, or the farms would be worse than useless; (2) the means for training existed at Saidápet which would thus be more useful; (3) the results of the instruction would be widely disseminated. The system would approximate to the Irish system in which district schools and farms supply partially trained pupils to a central institution, where their education is completed so as to fit them for farm superintendents, farmers, land bailiffs, &c. The Board and Government rejected this development of the scheme, but sanctioned a slight increase in the number of apprentices, and the appointment of an Assistant Superintendent, so as to set Mr. Robertson free for his district work; this led to the appointment of Messrs. Benson and Schiffmayer.

G.O., dated 7th April 1873, No. 397.

11. In June 1873, the Board addressed Government to the effect that their views had changed in favor of Mr. Robertson's scheme, and they recapitulated his reasons, observing that the farm could train both the district farm superintendents and also private students, who, they believed, would not be so ready to forsake the "favorite pursuit of their forefathers," if agricultural education were shown to be a means of getting money; they closed with the remark that the State is bound to provide the means of agricultural instruction for its *quasi*-tenants. The Board's First Member, however, wished district farms to be started at once with European superintendents, since trained natives were not available, considering the proposed education at Saidápet as secondary. He also urged that Mr. Robertson should be sent on tours of observation at cultivation seasons, so that while noting defects, he should see the better sides of native tillage.

Board's Proceedings, dated 20th June 1873, No. 1066.

12. The Board withdrew this letter for reconsideration, and consulted Mr. Robertson, who replied in his No. 713, dated 14th October 1873. Mr. Robertson here developed his original scheme still farther, protesting against any further waste of time and money in haphazard experiments, the unsatisfactory result of which compelled attention to other methods of improvement lest a "degraded husbandry" should become more degraded. He advocated regular agricultural instruction on the score both of the ryots' welfare and Government pecuniary interest, and urged that "example farms" should succeed the educational scheme and not *vice versâ*. He pointed out three stages of development; (1) the instructional stage in which young men were to be trained for observation and experimental inquiry and deduction; (2) the experimental farm stage in which the trained men were to ascertain facts as a basis for practice; (3) the demonstration or example stage in which the data and experience of the experimental farms should be disseminated by example on model farms. For these last, the country was not intellectually ripe, while men were entirely wanting for the second stage; hence the preliminary to further work was the first stage both for the training of the superintendent as well as other classes of students. He therefore proposed a regular college at Saidápet on the footing of the medical and engineering institutions, with practical work on the farm to foster a taste for agricultural pursuits, "because a student can become a farmer in no other way than by engaging for a considerable time in the actual work of a farm;" the students were to come from the educated classes. As a feeder to the college, he proposed elementary classes in mofussil schools which should eventually be taught by the college graduates, but at first by schoolmasters who should be put through a short course of training for the purpose. Mr. Robertson also proposed, as part of the college staff, an Agricultural Chemist, a Botanist and a Veterinarian, both for scientific investigation and for professorial duties, suggesting also that education in forestry and veterinary practice might be given at the college.

Board's Proceedings, dated 8th July 1873, No. 4206.

13. A majority of the Board now withdrew from their previous position, disbelieving that such instruction would really reach the real agriculturists of the country; they suggested that the shortcomings of husbandry were due rather to want of means than to want of knowledge of principles, and observed that the "degraded husbandry" fed 31 millions of people, besides providing exports and a large revenue; that in order to ascertain the real condition of agriculture, its wants and the remedies advisable, Mr. Robertson should be directed to make a very deliberate study of it by leisurely tours, and they laid down that "the most difficult and important object of study will be the way to influence the ryot," and that it would be a subject of regret if the college should be founded and subsequently closed because no general improvements could be traced to its influence.

Board's Proceedings, dated 25th November 1873, No. 2410.

14. It may be conceded that college instruction *per se* could not reach the masses, but it should be recollected that this was merely a portion of a scheme of which district farms, with their research and object lessons, were integral parts, and that these in turn would lead to a larger elementary scheme in the teaching of elementary classes in schools and of lads on the farms. Moreover, it is the ryot's *practices* and not a mere knowledge of principles that are to be dealt with; the superintendents were to get an advanced knowledge, not in order to disseminate mere principles, but to enable them to inquire and experiment usefully, to find out the reason and remedy for faulty practices, and to suggest methods of meeting the new economic conditions affecting agriculture. The department is not concerned with the fact that some ryots *can* till ground excellently, but with the facts that over vast areas they do not and cannot do so; that the land produces but a fraction of its proper yield; and that the standard of comfort and actual food-supply is too low for millions of ryots and laborers. A further commentary on the Board's opinion is the famine which followed within three years. It is, however, obvious that the Board hit the nail on the head in desiring a minute local study of agriculture and the ryot's practices, and in their dictum as to the importance and difficulty of getting at the ryot himself.

15. In 1875, Government ruled that though Mr. Robertson's scheme was "beyond present requirements," it was desirable to begin on agricultural education, and proposals were desired. Mr. Robertson submitted a large scheme on the assumption that there would be a great demand; provision was made for 24 stipendiaries, for private students, and for schoolmasters; young men destined for private work as owners, occupiers or managers of estates and candidates from various classes of Government employ, were expected, and he proposed to attract men to the college by making its certificate a qualification for certain public employments. The object of giving special courses to schoolmasters was to enable them to teach agriculture in schools, and to prepare lads specially for the college, so as to shorten the college course to two years by eliminating mere elementary work. This special course, however, merely embraced, as a purely optional subject, a few lectures and partial training in practical agriculture to such persons as were studying in Madras (at the Normal school) with a view of becoming schoolmasters. The Board approved generally of the scheme, but objected to the college certificate being made a qualification for Government employ, while the Director of Public Instruction had no faith in the attempt to attract schoolmasters. Government concurred in these views and sanctioned the college prospectus as an "institution designed to afford instruction in the science of agriculture, and in the practical applications of sound principles in conducting the ordinary agriculture of the country." Desiring, moreover, "to encourage the acquirement by schoolmasters of a fair knowledge of practical agriculture, to enable them to make elementary agricultural instruction a part of the curriculum in *all elementary rural schools*," they approved of the facilities offered to

G.O., dated 19th March 1875, No. 446.

Papers in G.O., dated 24th November 1875, No. 1683.

G.O., dated 18th May 1876, No. 642.

schoolmasters, and referring to an Irish scheme, desired proposals for a system of elementary rural instruction in agriculture. The importance attached to the subject is shown by the expression of regret that so much delay should have occurred "in inaugurating a scheme of instruction in agriculture, to which the highest importance should be attached," and it was unreservedly stated that the continuance of salaries at the farm was contingent on the success of the educational scheme. On the elementary school portion of the Government scheme, the Director remarked that the Madras Normal School was for training highly educated men for the higher class of schools and for District Normal schools, so that they could not come in contact with the agricultural classes, which have to be taught in elementary schools and in the vernacular, and that in their short course, they would get but superficial knowledge; he agreed, however, that it was well to teach such men, and that elementary agriculture might be made part of the curriculum of district elementary Normal schools; the grant-in-aid code was also revised in favor of agriculture. The Director's proposals were approved, but the Board remarked that the agricultural classes could not directly benefit by Saidápet, and that the success of the experimental institution depended on its graduates turning their attention "to the practice of agriculture and imparting in a practical manner the knowledge which they may acquire to the actual cultivators of the soil;" in other words, the graduates were expected to take to farming, and to apply to existing conditions the principles which they were to have assimilated at the college.

Papers in G.O., dated 21st September 1876, No. 1313.

16. It will be seen that a totally new system had been evolved out of the old idea of model or example farms; Saidápet, at first a simple model farm, was erected first into an experimental and model farm; then (in scheme only) into a central farm with (proposed) district experimental farms; the want of skilled superintendents for the proposed farms then suggested scientific instruction, which in turn developed in form till there emerged a complete and high class public agricultural college, the graduates of which were to disseminate their knowledge over the country; in other words, the old idea of the educational despatch of 1854 in the matter of literary education was repeated, viz., that a high education should be given to the most worthy recipients through whom knowledge should "filter downwards to the masses." The idea of the district farms had largely dropped out of sight, apparently in the hope that the college graduates would farm their own or others' lands and thus spread an improved practice.

It was forgotten, however, that district farms were absolutely necessary for experimental inquiry into the little known methods and conditions of the ryot, and for the practical training of the graduates who would be no more fitted for commercial farming without further and lengthened practice in working a farm, under good supervision, than a student of engineering would be fitted to design and build a railway bridge without workshop and practical experience. Experimental farms standing alone without a system of instruction, or mere college instruction without thorough *farm* training, would be equally useless.

17. Desultory efforts were, however, made to obtain lands for the district farms, though with such half-heartedness as led the Board to remark that the subject of agricultural improvement generally, and of district farms in particular, had been so handled as to show a scarcely veiled scepticism as to the possibility or probability of material improvements being effected. Possibly, however, the efforts were feeble, because it was seen that no superintendents were or were likely to be available for the farms, which would be useless without them. In May 1877, Mr. Robertson suggested that wider knowledge than that of 1871 as regards the country and the means advisable for its amelioration demanded a further change of programme, and advised the abandonment of a few large (200-acre) district model farms, in favor of more numerous, small educational farms; as formerly stated, example farms require a high state of intelligence among the ryots and can only be useful in conjunction with sound agricultural instruction. Attempts to impress adult ryots would

Papers in Board's Proceedings, dated 13th December 1877, No. 5223.

be useless, and it is therefore the rising generation who should be attacked with the weapon of agricultural instruction. He recommended six agricultural divisions, with a central farm of 100 acres at each divisional head-quarters, with district farms of 50 acres at each district head-quarters, and eventually small taluk farms; each division and central farm were to be under a superintending agriculturist from England, on Forest Assistant's pay, whose duties would be those of supervision of the district farms and the conduct of experiments, as originally ordered by Government in 1871 (paragraph 8 *supra*); each district farm was to be under an ordinary agriculturist, probably from Saidápet, and to be in immediate connection, as an essential, with a middle or high school; successful central farm experiments were to be repeated at the district or demonstration farms. In their review, the Board showed the necessity for a definite policy as regards the improvement of agriculture, and requested Government to lay down principles for future guidance. They believed that the only method was by "scientific agricultural education in connection with example farming conducted under trained and qualified superintendence;" a central school with a farm (Saidápet apparently) was the keystone of such a scheme, and it was impossible to expect "results" from such an institution while yet in the experimental stage; years must elapse without visible result, and, meanwhile, such institutions must be regarded as permanent, so that confidence might no longer be half-hearted. They therefore agreed with Mr. Robertson as to the divisional and district farm scheme, observing that more European supervision was necessary, as Saidápet graduates could not, for long years to come, be expected to stand alone, and that the farms, while partaking of the experimental, in that district practice and conditions and the application to them of scientific method could only be learnt by experiment, should chiefly be educational. Even so they deprecated any expectation of visible change for a long period owing to the condition of general backwardness—a condition which clearly emphasized the need for a definite and continuous policy. The Board suggested beginning with two divisions, to which Messrs. Benson and Schiffmayer, the Saidápet Assistants, might at once be deputed, their first duties being those of slow and deliberate tours of observation for many months, narrowly observing native processes and learning from the ryots their thoughts, habits and conditions of life, without which it was impossible they could begin to teach. The farm might subsequently be opened for operations and for instructing stipendiary apprentices and classes. The Board omitted the provision of district farms in these divisions, and Mr. Robertson supplied the omission by proposing six or eight such farms at various centres.

18. Consideration of this scheme was postponed owing to the exigencies of the famine period; meanwhile, the subject was revived by the Director of Public Instruction, who advocated agricultural classes at mofussil schools and colleges, utilizing the college graduates as teachers. This led to further proposals by Mr. Benson then in charge of Saidápet; he first followed Mr. Robertson, save only that the school farms at selected high or middle schools were the main features of his scheme, and the divisional farms somewhat secondary; he considered that elementary agricultural instruction at district schools should be the object of Government "rather than the pushing forward higher education of the nature given in the School of Agriculture," unless, indeed, *both* could be supplied. Hence the primary feature of his scheme was school farms. This followed the Bombay scheme, which was that the lads at the high and middle schools should be taught agriculture in class and in the field by instructors trained at Saidápet and supervised by a Professor of Agriculture; the scheme was said to be there at work with the exception of the appointment of the Professor, who, as supervisor, was the most important factor. The result of this scheme is not known. In October, he suggested a comprehensive scheme for a school farm in each district, under an agricultural instructor, and when these should be in full working order, a farm at divisional head-quarters might be worked as an experimental farm and school of practical agriculture, all eventually working up to Saidápet. It seems clear that the idea of experimental farms as the basis of teaching had now given way to teaching as preliminary to experimental farms, the school farms now proposed being mere places of demonstration like the laboratory in a school of chemistry. Mr. Benson, however, pointed out the need of a *preliminary* practical

Papers in Board's Proceedings, dated 7th January 1880, No. 33.

training, but did not develop a definite scheme, merely referring to the proposed district head-quarter farms as places where practical training might be given. The Board preferred the smaller scheme and recommended school farms only in selected districts, but suggested the formation of the classes before starting the school farms; they also omitted all notice of the divisional farm idea, and treated the question as one of mere educational policy; in such case there would be no possibility either of field demonstration or of practically training lads either for farm work or for proceeding to Saidápet. In 1880, Government sanctioned "agricultural classes" in three districts only, and in 1881 approved, "as a tentative measure," of detailed proposals for such classes at Salem, Madura and Cuddapah omitting the school farms till the classes were established, and not discussing the divisional farms, the necessity for practical training, or the much larger question of the experimental method of improving agriculture by local inquiry and by farms for research and demonstration. Here the matter practically ended: there was much correspondence subsequently, but nothing was done for reasons given by Mr. Grigg in his letter, No. 4625, dated 21st July 1887, read in Board's Proceedings, No. 277, dated 15th August 1887; see the paragraphs below on the subject of Agricultural Education.

G.O., dated 23rd March 1880, No. 358.
" " 21st July 1881, " 327.

19. The history thus far detailed has principally dealt with education; it will have been seen how the Saidápet Farm was to be the parent of divisional, district, taluk and school farms; how these required trained superintendents and how the necessity for these gradually developed a scheme of agricultural instruction which at length overlaid the original farm scheme. It has so far been impossible to sketch the history of the Agricultural Department, as a department, without making it a sketch of progress of agricultural education. The more technical work of the department as regards the farm work, the introduction of implements, tours, exhibitions, the distribution of seed and the like, will be dealt with under each head.

20. It will further have been seen that, beginning with the idea of at once replacing old practices and implements by new ones, and of teaching novel and probably subversive methods, the current of general policy changed into one of cautious inquiry and preliminary experiment, and that this in turn gave way to the simple teaching of scientific principles. Moreover, the policy was never thought through, and was consequently undecided and discontinuous, and but too apt to change in its ideas with the *personnel* of the authorities whether final or intermediate. The technical officers of the department, however, held throughout to the idea of practical farm work, based upon observation and experiment, and developed their educational scheme, partly to further farm operations, whether at Saidápet or in the districts, partly in recognition, as experience widened, of the necessity for some such general scheme, so that the receptivity of the rural classes might be developed *pari passu* with the dissemination of well-considered and demonstrated improvements.

21. Up to 1881, there was no Agricultural Department proper; the work of a department was done by the Board of Revenue with the advice of and by means of the Superintendent of Government Farms and his Assistants at Saidápet. The work was that of farm experiment and research, including a model farm till 1876, the selection and breeding of all kinds of stock, the distribution of seeds, the manufacture, testing and exhibition of new or improved implements, the making of tours of observation and inquiry, viz., those of Mr. Robertson to the Nílgiris and to Coimbatore, and of Mr. Benson to Trichinopoly, Cuddapah, North Arcot and Bellary, the organization of exhibitions, correspondence with the public on agricultural matters, the conduct of agricultural education, and the advising on all matters intended to carry out the expressed intention of Government to further, by positive action, the development of agriculture, and the progress of the agricultural classes in sound practice and in material prosperity. The mere work on the farm was but a small part of that which the Board and their agricultural officers carried on. It will be seen that agricultural inquiry both on the farm and by tours progressed, though not to a sufficient extent, simultaneously with attempts at positive improvement, while the dissemination of a sound agricultural education was begun. Details under each head will be found below.

22. But in 1881, the Government of India reviewed the whole subject in the light of the recommendations of the Famine Commission, and laid down the purposes and duties of an Agricultural Department as follows:—

Papers in G.O., dated 29th March 1882, Nos. 350, 351, Revenue.

(1) The collection and study of vital, economic and agricultural facts and conditions and the rendering available for practical use the information thus obtained.

(2) The general improvement of Indian agriculture with the view of increasing the food-supply and general resources of the people.

(3) Organization of famine relief.

This last is foreign to the present inquiry.

Acknowledging that, in Madras, the experimental farm and college afforded an opening for the extension of agricultural knowledge, the Government of India directed special attention to the work of agricultural *inquiry* as an essential preliminary to agricultural improvement, observing that public and official opinion had hitherto evidently supposed the conduct of agricultural experiments and the supervision of model farms to be the first and main duty of an agricultural department, a supposition which it was desirable to correct as regards the departments now to be constituted.* The primary object of the new department should be that of thorough agricultural inquiry by a permanent organization in touch with existing administrative arrangements; such inquiry would eventually disclose the best methods of (1) affording protection against drought and famine, (2) of attempting positive agricultural improvements. The prime necessity is an "accurate and comprehensive knowledge of agricultural life and practices," village by village, obtained by a department in close connection with the existing official revenue organization, seeing that this would give greater competence to the ordinary administration to deal with all revenue matters, which include all the dealings between Government and the ryots, and would utilize (in Madras) the complete village organization already available. The inquiry was not to be merely statistical collection or collation, but such an ascertainment of facts as would enable Government to devise and carry out a policy having as its object and result the maintenance of agriculture and the agricultural classes at their highest efficiency, an efficiency which must deteriorate when rental or fiscal systems are faulty, capital insufficient or inaccessible, seasonal failure frequent, cultivators and their cattle badly fed or cared for, implements faulty or deficient. As soon as this analysis enabled agricultural difficulties or distress to be localized, positive treatment would be adopted, whether by improving communications, by irrigation or afforestation, by the supply of cattle and seed, by emigration, or by reforms in the fiscal or rental system.

23. The above remarks are the development of the first object laid down by the Government of India for the work of an agricultural department, viz., the ascertainment of statistics and facts so as to allow of an intelligent treatment of difficulties likely to produce famine or distress. But the second object was the actual improvement of agriculture with a view to a general advance in material prosperity; on this point the Government of India observed that, after attention had, as above stated, been primarily given to inquiry and to such localities as thereupon showed depressed agricultural conditions, considerations should *thereafter* be given "to general agricultural improvement by the introduction of new staples and implements, the trial of new industries, and the experimental adoption of new methods. In dealing with these questions, it may, as time goes on, become the duty of the department to inquire how far the physical researches of the West may be beneficially applied to the agricultural system of this country, and to associate with itself in this investigation the assistance of qualified experts, as in the development of irrigation, the breeding and diseases of cattle, the work of forestry in rboriculture and reboisement, and that of science whether in developing fresh industries or, more especially, in the researches of agricultural chemistry. But though these admittedly exist as great wants, the Government would not invite proposals to supply them, preferring to obtain a securely organized administration for the preliminary stage of inquiry." The exact meaning here is not quite clear; agricultural inquiry is not mere collection or even collation of figures; it is not even mere observation; it is a rigid examination and testing of the

local facts, reasons and conditions of agriculture. Obviously the most conclusive method of inquiry is that of unprejudiced experiment; it is by questioning Nature in experiment that the agricultural expert ascertains how far the cultivator's labor is hindered or nullified by hostile natural conditions, how far natural conditions are abused by the mistakes of the cultivator. Nor is it clear why the work of the irrigation engineer, of the veterinary expert, or of the forester is to be a possible subsequent stage of the work of the department, seeing that these scientific departments are already in existence and at work.

24. In a subsequent letter, dated 14th May 1883, addressed to the Government of the North-Western Provinces, but communicated to this Government, these views were enforced; the following duties were laid down as the successive work of the new department:—

Papers in G.O., dated 7th August 1883, No. 956, Revenue.

(1) The organization of a statistical examination into all the more salient points of an agricultural inquiry.
(2) A subsequent analysis for administrative purposes of the facts thus obtained, with a view to the protection of areas against famine; the process to be that of ledgering village statistics under proper heads.
(3) An adaptation of the revenue system to agricultural facts and conditions.
(4) The adoption of such measures of protection, including arboriculture, as tend to the security and stability of agriculture.
(5) When the above matters have been "thoroughly taken up," it will then be time for the Agricultural Department to set about the active introduction of positive agricultural improvement, such as new machinery, or new methods of cultivation; this would include experiments, such as farms.

Obviously, this order of duties narrowed present positive work within very confined limits; farms, at least demonstration farms, would be ruled out, and attention to agricultural exhibitions, at least in the North-West, was expressly deprecated on the ground that the department required firmer organization. Nevertheless, the Government of India, while deprecating hasty advances and desiring experimental work "and attempts at positive improvement to be confined for the present within the narrowest limits," would not desire the neglect of all preparations for improvement; for instance, it would desire that there should be in the Province "at least one Government experimental farm," and that enlightened cultivators "should be encouraged to associate themselves with the department in carrying out experiments," which should be few, simple and well tested before attempts at their extension. In fact, the Imperial Government had, in their first communication, laid down that it should be "the earliest ambition of the Agricultural Department to secure the active aid of those members of the Native community who are sincerely interested in agriculture, seeing that it is by the community alone that agricultural improvements can be effected on a large scale, that many of its members have experience, influence and capital, and are acquainted with the often-times hidden reason of apparently perverse or illogical processes, so that by their aid might be developed "the true policy of progress in *improving and adding to indigenous conditions* without that subversion of ideas and methods which is likely to accompany the introduction of exotic reforms." In effect, therefore, the Government of India expanded and gave authority to Mr. Robertson's idea recited in paragraph 12 *supra*, that the three stages of agricultural improvement should be (1) inquiry and observation, (2) experiment, (3) demonstration.

25. Exceptions to immediate positive improvements were, however, to be made in matters of well-irrigation, experiments on "reh" (saline) lands, arboriculture, sericulture and the encouragement of manufactures. It is curious that the matter of agricultural education should find no place whatever in the Imperial programme, seeing that the perception of the new conditions of agriculture and rural economy, of the value of new methods and a practical acceptance of their results, could best or only be expected from cultivators better trained to observe and less rigid in their conservatism than the present race of adult ryots. In this Presidency, where the bulk

of the cultivators are very small proprietors or tenants, this subject seems to deserve a prominent place; it is an improvement which may be set in hand at any time irrespective of agricultural inquiries, and one which *must* precede the intelligent acceptance of the results of such inquiries.

26. The Board at once pointed out that, in this Presidency, little was needed to render complete the village statistics, worked by the Board of Revenue, that much information for district improvements was already on hand, that the direct improvement of agriculture had long been attempted, though, as admitted by the Government of India, hindered by want of funds, and that it had recently been proposed to strengthen these attempts by a continuous series of exhibitions, by district "model" (?) farms, and by strengthening the executive agricultural staff. They considered that both with a view to economy and in order to utilize the existing organization from the Revenue Board down to the village, the new department should not be a separate one, but should be worked by the Board. Government concurred generally in this, but recommended that the Directorship of Revenue Settlement should be revived and that the Director should be in charge of the new department, with Mr. Robertson, as an expert of ability and experience, as Agricultural Reporter. In this way, the revenue staff of each district would be available, through the Director, for the collection of statistics and information and for the introduction of well-considered improvements under the advice of Mr. Robertson, who would also be required to make tours of inquiry and to prepare an agricultural analysis of each district from the stand-point of an expert. This scheme was duly sanctioned.

G.O., dated 29th March 1882, Nos. 350, 351, Revenue.

27. Mr. Wilson, the first Director, then submitted his detailed scheme for the new department. The objects laid down by Government for inquiry were as follow:—

(1) The collection and record of statistics bearing on the vital and economic condition of the agricultural classes, with a view to agricultural improvement.

(2) The maintenance of village registers containing an accurate record of the country and its inhabitants in continuation of the information now collected and recorded by the Settlement Department at the time of settlement.

(3) The analysis of the Presidency, district by district, with reference to its requirements for irrigation and pasture.

(4) The organization and education in conjunction with district officers, of the staff of Revenue Inspectors, through whom all agricultural information is to be collected for Government and agricultural improvements brought to the notice of the ryot.

(5) The organization of the arrangements required to carry into effect such of the provisions of the proposed irrigation law as may involve the utilization of communal labor.

(6) The preparation of agricultural reports and the arrangements of schemes for famine relief of an agricultural character.

On this programme, he observed that in the records of the Government villages which extend from the field up to the Council Chamber, nearly all was contained that was required for the proposed statistical inquiry except as regards the outturn of produce and the requirements for irrigation and pasture; that a scheme (Mr. Garstin's) had just been propounded for the improvement of the staff of Inspectors; that much had been done at the farm and by agricultural tours towards a collection of agricultural facts; and that the efforts were controlled by a permanent organization, viz., the Board of Revenue; in other words, that there was already a Department of Agriculture, in all but the name, which had for years been carrying out not merely agricultural inquiry but attempts at progress, and that it was, as demanded by the Government of India, "worked by the ordinary official staff," which, in Madras, is by its nature intimately connected and concerned with the agricultural classes and their welfare. For zemindari and inam villages, it would be necessary to amend the law (Regulation XXIX of 1802), which forbids any demand being made for statistics

from zemindari records. Mr. Wilson therefore suggested that the new department should be merged in the Board by simply improving its internal arrangements, so that a bureau of the Board should deal with land revenue, agriculture and cognate subjects.

G.O., dated 7th August 1883, No. 956.

Government negatived Mr. Wilson's proposals, observing that the record of ordinary statistics, though very valuable, was not merely incomplete, but not systematized from the agricultural and economic point of view, and, above all, that the information was not concentrated and ledgered so as to be immediately available for administrative purposes. Further, that this statistical survey was only the foundation for a superstructure of direct agricultural improvement, so that a separate department was absolutely necessary, though, temporarily its head was to be a Member of the Board so as to have access to the Board's records.

The outcome of the discussion was that the Director of Settlement and Agriculture became a Member of the Board and Commissioner of Revenue Settlement, Land Records and Agriculture in charge of—

(*a*) Village accounts, agricultural records, statistics of season and rainfall.
(*b*) Kistbandi.
(*c*) Agricultural experiments, farms and introduction of agricultural improvements.
(*d*) Analysis of districts with reference to famine protection.
(*e*) Season remissions.
(*f*) Cattle disease.
(*g*) Special crops.

28. A discussion ensued as to Mr. Robertson's position and it was proposed by Government to separate his work as Principal of the College entirely from that of agricultural work proper; he was therefore placed under the Educational Department, while Mr. Benson was made Superintendent of Government Farms and Agricultural Reporter.

Papers in G.O., dated 16th February 1885, No. 194, Revenue.

This change led to an inquiry by the Government of India as to the future policy of this Government, as regards experimental farms and other agricultural institutions; the previous suggestions of the Imperial Government that existing native methods should be more closely inquired into before introducing experiments on foreign systems were pointed out; and an opinion was desired as to "whether the expenditure incurred in the past on the model farm at Saidápet has not been somewhat disproportionate to that which has been devoted to the system of record and investigation advocated in the Resolution" above-mentioned. This latter point will be dealt with under a separate heading; it may be noted here that Government, the Board and the Director all condemned the farm. The Government of India were, however, wrong in describing it as a model farm, seeing that it was purely experimental and educational, and in so far as it was experimental it was fulfilling

G.O., dated 14th May 1883, No. 445-A.

the wish of the Government of India expressed in May 1883, that there should be at least one such farm in a Province where experiments and supposed improvements might be intelligently tested. In

Papers in G.O., dated 20th February 1879, No. 439, Revenue.

1879 this farm was adverted to by the Government of India as doing good and useful work in experiments, in developing agricultural education, and as the proposed centre of agricultural stations for experiment and education, a scheme then remaining in abeyance for want of funds which had ever been a principal cause in impeding the expansion of the Madras department.

29. As regards the future policy of the department, the Board said that the outcome of their policy should be "the increase of the produce of the soil, and thereby the wealth of the country and the welfare of the people." Hence action should be based on the following lines:—

(1) That the crops now grown are the outcome of long experience and should therefore be accepted as, on the whole, the best suited to the soil, climate and habits of the people.

(2) That this being so, it is useless to try and change habits and tastes, as by growing wheat instead of ragi or rice; sound policy is to increase the produce of indigenous crops.

(3) That this can only be done by "high farming" which means simply *manure*, or its agricultural synonym, money.

(4) That the South Indian ryot is a very shrewd, hardworking man, thoroughly alive to what is *proved to him* to be, and which he therefore *knows* to be, his own interests, and perfectly ready to abandon time-honored paths if it will pay him to do so: this fact should guide the policy of experimental farms.

(5) That material increase can only arise out of the action of the State owing to general poverty; the best modes of action would be (*a*) manure manufactories, (*b*) loans for land improvement either on the sinking fund principle, or at 5 per cent. interest, optionally repayable.

(6) The collation and publication of outturn statistics.

(7) The abandonment of the model farm at Saidápet as such, and the conversion of the College into a School of Agricultural Chemistry and Veterinary Science. The Board suggested advances of manure instead of money as a possibility for consideration, and observed that experimental farms would be most useful in demonstrating visibly the profits derived from manure.

30. It may be suggested that the Board's dicta are open to argument.

(1) and (2)—The crops grown may be only the best available under former conditions and knowledge; it does not follow that they are the best now available. What was the best under the conditions of self-sufficing farming may not be the best under the condition of a large export trade; what sufficed for a small population may not be best with a heavy population; what was best with precarious irrigation or a bad subsoil may not be best with assured irrigation or a cultivated sub-soil. Moreover, exotics often prove to be more suitable than indigenous crops, either to support a given population or to existing conditions; the potato in Ireland and on the European continent, and maize in Behar are cases in point, and various plants, such as Mauritius sugarcane and guinea grass, are far better than the indigenous product, or, as cinchona, grow more productively than in their original habitat. Maize is a good example of a foreign crop which has rapidly found place; in Dr. Buchanan's time it was hardly known in Behar, but it is now, with millet, a chief article of food. Some of the chief food-crops, *e.g.*, varagu, koralu, are of a very low and even bad food character compared with maize, wheat, &c., and are only adapted to a low practice and worn soils; rice even is a poor food-producer. It may be added that a constant growth of the same crop probably causes disease and short and poor outturn of produce, evils which might probably be removed by diversified cropping, which again might lead to economy in the use of irrigation water, and if so, is most worthy the attention of the State which derives a revenue from the water and has to pay the cost of scarcities.

(3)—Manuring highly is not high farming; this latter connotes *better farm management* which is much more than high manuring and requires greater intelligence, more labour, a better system, receptivity and adaptability. Moreover, manure is not agriculturally synonymous with money, *i.e.*, does not *necessarily* demand more capital; it may and does mean better prepared manure, less wasted, better applied; above all conservation of almost unused substances, such as human excreta, bones, tank-bed silt, &c.; it connotes also more fuel trees.

(4)—The character of the ryot is too highly drawn; it is a matter of history no less than of observation that the small farmer is most ignorant, prejudiced, and careless of change. Even if it be admitted that he will change upon demonstration that a thing pays, the difficulty is to demonstrate it *to his perception;* absolute proof or proof to a scientific expert is one thing, proof to an ignorant ryot is quite another. If, however, it is true that progress waits upon demonstration, that demonstration is the one thing necessary for progress, then it is the more obvious that the department is bound to afford that demonstration. Hence experiment and example farms are necessities.

(5)—The State must truly help, for there is none else; but it is not merely poverty that prevents increase of produce, but ignorance of possibilities and a low order of intelligence. Moreover, as observed by Professor Baldwin of the Irish peasant farmer, what is wanted is more labour which is the equivalent in some senses to capital; more and *more intelligent* labour would double the produce of the soil. But it is true that the introduction of capital is much needed, and manure advances are actual facts in Belgium.

The future of the department largely rests upon the views taken on the above and similar questions.

31. The Director described the future agricultural policy of the department as one "having for its ultimate aim the prevention of famine." The measures to that end he described epigrammatically as "wood, water and roads;" by "wood" was meant forestry in its largest sense as supplying for the ryot timber, fuel, fodder and pasturage, and as influencing climate and water storage; by "water" was meant irrigation whether public or private, direct or by the mere removal of hindrances to private extension; by "roads" was meant every facility to the exchange or transfer of produce and thereby to the extension and intensiveness of cultivation.

The Director considered that actual improvements must, in the main, be the work of the agriculturists themselves, but that *when* the necessity for intensive cultivation is recognised, Government should aid by experiments in rotation, manures, the pedigreeing of seeds, the introduction of new staples and the establishment of Agricultural and Veterinary Colleges and Schools. The Director then went on to discuss the farm and to recommend its abolition; his opinion and the similar one of the Board will be mentioned below. But he pointed out the necessity for thorough inquiry as a preliminary to experiment and that knowledge of the ryots' crops and practice was yet very defective; hence he suggested that Mr. Benson as an expert should be employed on a careful analysis of crops and practice, with Agricultural Inspectors as Assistants.

32. The Director's position as regards the opportunity for Government intervention is not quite clear. It is surely a fact that there is a necessity for intensive cultivation; famines, a rapidly increasing population, a low general outturn and a low standard of comfort, surely show this; this being so, either the ryot does or not recognise the necessity: if he does, then it is admittedly time to begin and push experiments and render help so as to keep pace with the necessity and so as to supply the ryot with the means of self-development: if he does not recognise it, then the problem is infinitely more serious, for the department will have to attack the ryot and not merely the problem; the ryot will be a passive obstacle, not an active helper. That the ryot does *not* recognise the necessity, save dimly and occasionally, is believed to be the great difficulty of this period. Even if the necessity for intensive cultivation is not yet so pressing, surely it is still necessary to undertake experiment, which demands long periods, so as to be ready in advance for that most certainly approaching necessity. The supply of seeds, the ascertaining of implements that will render labour more efficient in crop production, the exhibition of new and improved staples, and the supply of practically trained teachers, seem of immediate importance.

33. The Government decided that the farm ought to be abolished and that no example farms ought to be established, knowledge of Indian crops being as yet too defective; meanwhile, experiments, where necessary, would be carried out by aided private agency, and native farm management and agriculture were to be investigated by the Agricultural Reporter "with a view to introduce better methods where they are wanted, but there only. Further than this the Government are not at present disposed to go." Mr. Wilson's general proposals to foster forestry, irrigation and communications were approved; but consideration of the Board's proposals to make and distribute manures and grant loans was deferred. The Saidápet Farm was accordingly abolished as such from September 1885; it was a mere stock depôt till September 1886. A small annex for educational purposes was handed over to the College. The distinct post of Agricultural Reporter was also abolished in 1885, and the position of the officer (Mr. Benson) in charge of the work of the Reporter more definitely indicated by his being appointed Assistant Commissioner of Agriculture.

34. It having now been distinctly laid down that a minute agricultural analysis of the country was the pre-requisite for bringing the department "into more practical

and intimate relations with the agriculture of the country," the department turned its attention to such analysis. A very elaborate scheme was drawn up for the examination of Kurnool which was selected as the first for operation; the survey embraced an elaborate economic survey of the district, including configuration and climate, vital statistics, tenures, agricultural classes, their capital, stock and labour, agricultural management, practices and produce, irrigation and communications, as major heads, and a great variety of sub-heads. A letter from the Secretary to the Government of India adds other items for examination, such as settlement assessments and results, fiscal statistics, prices, arts, industries and trades, fruit, fuel and pasture reserves, famine and famine relief works, &c.; but this letter wholly omitted any mention of a study of agriculture proper, its crops, methods, and defects and other express objects of inquiry by an agricultural expert; the analysis was one of rural economy and statistics for famine purposes only, and was not an agricultural investigation. Much correspondence ensued on the methods of this inquiry and it became obvious that generations must pass, and lakhs of rupees be spent, before a survey on the proposed scale could be carried through, and the whole value of the analysis, viz., an immediate survey for the early detection of weak places, the ascertaining of the degree of protection required against famine, the remedying of fiscal errors and defects and the commencement of positive improvements, would be lost. Meanwhile a beginning was made and the Assistant Commissioner with seven Agricultural Inspectors besides clerks were engaged on this duty in Kurnool.

Papers in G.O., dated 20th October 1885, No. 1171, Revenue.

35. But the Secretary to the Government of India pointed out that the Kurnool analysis was beyond what was required by that Government in their Resolution of 8th December 1881 (paragraph 22 *supra*); that what was wanted was a carefully maintained series of village records; that the required analysis was one of figures and facts, derived from the papers and reports annually received; that "a careful abstract of the contents of settlement reports and of already existing village statistics will provide a sufficient basis for administrative purposes," and that for this purpose no special staff controlled by independent officers was necessary, but that the village, taluk and district staff should work out the details. In other words, looking to the existing system of Madras administration, all that was wanted was an examination of existing village records with such additions and improvements as might be necessary. This is now being carried out in all districts by the district officers, the present village and taluk manual accounts being slightly improved. From these accounts, it will be possible to compile statements by special tabulating clerks, regarding population, climate, soil, distribution and proximity of population, irrigation, occupied, cultivated and waste areas, assessments, prices of produce, outturn of crops, communications and other matters. For special agricultural inquiry, Agricultural Inspectors working under the Assistant Commissioner will be required; these will make a detailed study of agriculture, stock, the value of land, the status of the ryot and cultivator, &c. This is now almost the only work of the Agricultural officers proper; it may indeed be said that the main strength of the department, on its Agricultural side, is devoted to this business of Famine Analysis, the largest part of which consists in the mere tabulation of village statistics. The Kurnool Analysis, being in an advanced stage, will be pushed on to completion.

Papers read in G.O., dated 24th March 1887, Nos. 319, 319-A, Revenue.

36. The department as newly organised in 1882 has thus been traced up to date, but its operations have not been confined to the agricultural inquiry specified as its primary object; each head will be separately dealt with hereafter; it may suffice now to point out—

(1) That the Government Farm continued to be worked by the department till its abolition in September 1885.

(2) Agricultural experiments in diversified cropping and tobacco culture were sanctioned in May 1885, postponed in February 1887, and have now been resumed so far as tobacco is concerned. Sericulture, ensilage, experiments in wheat and other crops, have also had a considerable share of attention.

(3) A series of agricultural exhibitions was resumed in 1887 and has since been continued; there was also an exhibition at Madras in 1883.

(4) Agricultural implements have received much attention, both in experiments, exhibitions, ploughing matches and by travelling demonstration shows.

(5) Stock-breeding, necessarily abandoned with the Saidápet Farm, was resumed in 1888; pony breeding has also been carried on; mule-breeding was tried for years, but was a failure.

(6) Operations against cattle disease were taken systematically in hand.

(7) Assistance was given to private effort.

Agricultural education had been handed over to the Educational Department in 1884. The department is now engaged on all the other classes of work.

37. *The Saidápet Farm.*—The early history of the Saidápet Farm has already been mentioned. Its history as an Experimental Farm may be found in its reports which are analysed and consolidated in the "Saidápet Farm Records." The work of the farm was described by Mr. Benson in his reply to the Famine Commission:—

"In 1865, the Saidápet Experimental Farm was started, and after undergoing various vicissitudes for three or four years under the direction of a committee of gentlemen amateurs and untrained superintendents, the services of Mr. Robertson, the present head of the Agricultural Department, were secured in 1868. What has been done on the farm since then is detailed in full in the Saidápet Farm Manual now under preparation and nearly ready for the press. It may, however, be observed that the farm being the only institution of the sort in Southern India, it has necessarily been obliged to undertake a great amount of work in experimental agriculture of a description not usually undertaken by Experimental Farms. From the entire absence of any writings on the agriculture of the country, the apathy and ignorance of the cultivators, and the imperfect character of the records of the results of previous efforts in improving native agriculture, there was no alternative but to institute experiments of the most elementary character. As all will understand who know anything of agriculture, experience gained in this way accumulates but very slowly, as each result needs to be confirmed under different conditions and circumstances before any decided conclusions are possible. However, not only has the farm had to engage in original research in establishing the general principles by which the efforts to improve our agriculture should be guided, but it has had to do the work of an Acclimatisation and Agricultural Society in introducing, acclimatising and improving animals and plants that were likely to be of use, besides introducing and modifying machines, implements and tools of other countries adapted in some respects to the wants of Madras agriculture. Attention has been given to sub-soil drainage, improved tillage, the restoration of exhausted soils, the utilisation of irrigation water, the fertilisation of arable soils by the use of lime, saltpetre, oilcake, poudrette and other manures available in Southern India but now unused by the ryot; the introduction of new crops suited to the climate of India and adapted for cultivation under an improving agricultural practice, such as maize, sorghum saccharatum, Carolina paddy, guinea grass and other grasses; New Orleans and other superior varieties of cotton; tobacco of kinds, &c.; the production of live fences in view to affording protection, shelter, and fuel; the introduction of water-lifts, barn machines, carts, ploughs, cultivators, cattle-hoes, reaping knives, &c., of improved construction or suited, after undergoing modification, for use in this country; the improvement of native live-stock by careful breeding and feeding, and by introducing and acclimatising new breeds, &c.

"It has been conclusively proved that deep cultivation is a powerful prophylactic against drought; that the use of the English plough is far more economical and effective than that of the native implement; that the country is particularly rich in easily-grown fodder plants; that by care in selection and feeding, a breed of sheep which will produce fair wool can be bred from the native stocks, and many other things concerning which no reliable information was forthcoming previously but which it would take too much space to relate here.

"It must not be forgotten that besides the direct farming operations of the Saidápet Farm, which constitutes a part only, although an important portion of the work of the Agricultural officers of Government, there are several other things of the greatest importance, which take up a considerable portion of their time; these are (1) the direct management of agricultural education; (2) the preparation of agricultural text-books, agricultural reports, pamphlets, &c.; (3) the answering of references on agricultural matters from Government, the Board of Revenue and the Collectors, and the Government officers and the public generally; (4) the inspection of tracts of country and the preparation of reports on their agricultural conditions and capabilities; (5) the management of agricultural exhibitions, &c. It is well also to observe that this Presidency possesses no agricultural literature, and that the officers of Government have no fellow-workers in the field of inquiry."

Similar work was carried on till 1885, the correspondence with the public increasing to a considerable volume. It may be said that the results of deep cultivation with

manuring in the drought of 1876-77, whereby a crop, poor indeed in grain but respectable in straw, was produced with only one-sixth of an inch of rain, and good crops both in grain and straw with somewhat larger but still extremely deficient falls, when shallow-tilled crops utterly failed, the effect of green-manuring, the introduction of guinea grass, the experiments and results in fodder crops, the proof that much better cotton and three times as much of it can be grown by proper management on even poor sandy soils, are worth all the money spent on the farm, while the reports are a valuable record on other matters.

Experimental farm.			
Period.	Gross cost.	Receipts.	Remarks.
	RS.	RS.	
1865—71 ..	80,552	27,917	Gross cost from 1871 excludes paid superintendence.
1871—82 ..	1,07,941	38,638	
1882—88 ..	35,651	27,004	
Total ..	2,24,144	93,559	

38. The farm was abolished in 1885 upon a query from the Government of India whether it was not expensive in proportion to the amount spent on preliminary inquiry; the query does not seem to have objected to the absolute but to the relative cost. But the Board and the Director considered that the farm was in itself an expensive failure whether as an experimental or model farm; the Board "believed that no reliable tables either of the chemical constituents of the various soils of the country, nor of outturns per acre of the various crops grown in it, nor of the cost of cultivating a given area with any given crop, have been compiled;" that the crops grown on the farm, though with many of the resources of civilisation, are not particularly excellent; that the doubts of the ryots as to the advantages of new implements had not been removed; that, as regards its influence on general agriculture, it was a failure. Mr. Benson seems to have stated that its soils were useless for testing deep and shallow tillage, that it was too limited for cattle-breeding, its soils too poor for seed-pedigreeing and useless for experiments with manure. Government accepted their views and abolished the farm, observing that "our knowledge of Indian crops is too limited as yet for useful experiments."

Papers in G.O., dated 16th February 1885, No. 194, Revenue.

39. It is probably true that the farm did not fulfil the expectations formed of it; whether those expectations were well-founded and reasonable, or whether there was time to carry them out, or whether the general agricultural policy of the period gave the farm a fair chance, are matters of argument. Regarding the want of knowledge of Indian crops, Mr. Benson observed in the Farm Report for 1879-80 that the necessity for observational tours had often been urged, but that without more strenuous efforts there would be no progress, and pointed out that the Superintendent could have no reasonable time, as he was also in charge of the Saidápet College. Hence he considered that a special officer should be detailed for close study, as in the case of the Geological Survey. This recommendation exactly anticipated the orders of the Supreme Government in their Resolution of December 1881 for accurate agricultural survey as a primary necessity; it was, however, never carried out. It may also be suggested that the best way of learning about the crops of a country, and, especially, the conditions under which they are grown, is in experimental district stations where trained men can conduct experiments and inquiries: such stations formed part of the agricultural scheme since 1870 (paragraph 8 *supra*), but were never started. Such stations would also have served as the means—and are in fact almost the only means—by which statistics of the kinds mentioned in the Board's criticism could be obtained; without them it is not clear how the Superintendent of an isolated farm at Saidápet could collect and collate statistics regarding the soils and crops of the country generally. As regards implements, it may be noted that officials and private firms all over India have engaged in this work, but not even yet have fully satisfactory ploughs been exclusively arrived at, even though manufacturing firms with a direct interest in the matter have spent years of time and thousands of rupees in the inquiry. As regards the influence of the farm on general agriculture, it is difficult to say that the farm has had a full chance; a solitary farm laboring under great initial and continuing

difficulties can hardly impress a province, even if thoroughly successful. As remarked by the Government of India, "Experimental farms, *when they stand alone*, are of comparatively small utility. To be really useful, they should be *part of a system* of agricultural instruction. If the students are taken from the classes dependent on the land for their living, satisfactory progress in the diffusion of agricultural instruction under such a system will soon be apparent." It may fairly be said that such a system has, as yet, had no real trial. The Saidápet school had not long begun to send out its graduates when the farm was abolished; few, if any, of the students were of the class who were really *dependent on the land* for their living; the graduates have not had much chance or been capable, for want of practical training as farmers, of taking a real part in agricultural advancement, and of other agricultural instruction there has been none.

Papers read in G.O., dated 20th February 1879, No. 439, Revenue.

40. What was wanted to make the farm of value was the dissemination of the facts ascertained, and it is the entire absence of any agency for such dissemination that led to dissatisfaction with the farm itself. Though from 1870 the farm was merely regarded as, and declared to be, one of an intended series, and as a central farm for the initiation of district demonstration farms, and as a training ground for future superintendents of those farms, no such farms were ever started. When the idea of model or example farms was abandoned, it was only in favor of educational farms and schools, and the avowed policy of the still later method of high agricultural education at Saidápet was not merely to supply superintendents, but to educate men who would go down and instruct the masses either in schools or as farm managers or on farms of their own. Moreover, the farm and its officers were really attempting the work of a whole department, beginning with the most elementary work and building up, as experience grew, a system necessarily, as being the first of its kind, tentative, experimental and sometimes misdirected. It should not be forgotten that the farm started with aims and ideas which even now would be called premature and doubtful; it was to be, at least in part, a model farm and to exhibit the assumed advantages of European implements, imported direct and regardless of their suitability; the subversive method for practice as for ploughs was in the minds of its original founders; hence slower progress than might otherwise have been attained. The position and soil of the farm were moreover against it. General Cotton, in his letter of 11th November 1871, warned Government that it was not fit for its purpose either in area or position and begged that another site might be selected; it was not good enough for a proper seed farm or for cattle-breeding, and neither the extent nor the variety of the soil rendered it sufficiently typical to be a central farm, nor were the irrigation facilities such as to enable the great questions of the value and use of water to be properly asked or answered. Mr. Robertson, who had then lately joined, considered the farm good in its position near Madras, stated that the soil was poor though rapidly improving, and that a good seed soil was always "an artificial creation, the result of the skill and enterprise of the farmer;" but he expressly pointed out that the farm was only one of a proposed set of farms then under organization. His views would probably have differed had he known that no other farms would be started, and longer experience showed that the soils were very hungry and difficult to deal with by Government officers working with hired labour and bound to add up the cost of hired labour as against the ryot who works "for his own hand." There is then much reason for the opinion that too much was expected from the farm and that the failure to meet expectations was at least largely due to mistakes and difficulties incidental to a brand new enterprise, absolutely devoid of any foundation in experience, hampered by consequent changes of policy which had to grow by experience, cramped by want of funds, impeded by general conservatism and ignorance, and having as its actual agent only a single member of an organism which existed but in contemplation. It may be added that the utter failure to work a model farm reacted prejudicially upon the experimental farm, though the two are not necessarily connected.

41. The Saidápet Farm had also a model farm in its limits. This was started in 1871, but the attempt was closed in 1876 as a failure. Mr. Robertson's views were that the soil was very bad, that the

Report of 1875-76.

expense of reclamation and restoration was excessive, and that no commercial profit could be expected, especially as the manures used in high farming would largely be lost for want of drainage and protection from floods. He pointed out that the original tenants of the land were hopelessly in arrears when the land was taken over, which was done at the request of the tenants, who petitioned to be relieved of their leases. Mr. Robertson believed that "there is, perhaps, in cultivation in this Presidency, no tract of land containing soils of such a low order as those that constitute so large an area of the land on which the experiment was conducted," and stated that "if he had another such experiment, he would insist on fair land and on all necessary land improvements prior to beginning agricultural work." The attempt was abandoned in 1876 as a total failure. In 1879 the idea was revived, but protested against; Mr. Benson said that only 14 acres were available and those were unsuitable; that the locality of the farm, as regards the class of neighbouring ryots, who were generally paupers, was objectionable; that experimental work and preliminary inquiry into native methods, &c., were as yet insufficient to enable the farm to show a system and practice which it was advisable definitely to adopt. In fact he objected to model farms altogether, pointing out that they had everywhere been abandoned as methods of reform, even in progressive countries, and that *á fortiori* they would be useless in this country, and in the Saidápet locality in particular, and that the duty of the farm was to experiment and to demonstrate to students and the public those principles of agriculture which hold good under all conditions, leaving it to the public and the students gradually to adopt and engraft on their own practices such results as might be suitable and such improvements as a knowledge of right principles would suggest. He also called attention to the proposals of the Board in Board's Proceedings, No. 5253, dated 13th December 1877 (see paragraph 17 *supra*); if these were adopted, it might be possible to work small demonstration farms beginning with native methods and gradually working upwards to a better practice. The Board said that under the circumstances there was no alternative but to accept the position; subsequently, for several years, they desired that part of the farm might be worked on commercial principles; in paragraph 96 of his report for 1879-80, Mr. Benson promised to do so, though much against his own ideas; nothing, however, was actually done, though in each successive year the Board repeated their desire; the attempt was finally abandoned in 1884.

Model Farm.			
Period.	Cost.	Receipts.	Remarks.
	RS.	RS.	
1870—76 ..	26,159	13,259	Cost excludes superintendence.

42. The result was very disappointing. In the early part of the attempt, Mr. Robertson was hopeful of the soils, of which, it was admitted even in 1876, that 60 per cent. was better than the rest; the description of the dry soils in 1871 was 30 acres of blowing sand, 40 acres sandy loam of fair quality, and the remainder stiffish loam; about 30 acres were irrigable but not under a good source; on this area a very large sum was spent; in 1874-75 Mr. Robertson said that "the surface of the land is now almost all that could be desired," so that rains did little damage and stagnant water accumulated less; as for the character of the soil generally it is presumable that plenty of manure had been put into it and its condition improved by good cultivation. Mr. Robertson expressly states that the land is worth per acre a price that would recoup all expenditure, and puts down its value at Rs. 140 per acre, wet and dry together, a value which, speaking generally, is higher than any dry land or garden land in the country. This being so, it is strange that skilled farming could not only not show a profit, but that there should be a debit balance in 5 years of Rs. 5,920, exclusive of the cost of the buildings, roads and original cost of the land. Mr. Robertson objected to the land on the ground that it was exhausted and worn-out land, and that restoration of soils is a most difficult problem; on this it is to be observed (1) that the experts are never tired of insisting that the soils of this country generally are deteriorated and exhausted; (2) that it is certainly a fact that millions of acres are called upon to feed an immense number of ryots, though in a far worse condition than the Saidápet soils; (3) that the object of the model farm is comparative, that is, a comparison of the results of "improved farming," acre for acre, farm for farm, with those of the ryots; (4) that

no such object can be attained if the conditions are dissimilar, and that the model farmer ought to put himself in the ryot's place; (5) hence that to insist on fair or good soils, provided with all necessary improvements, is not to farm as an example at all, and that it is absurd to claim to farm as a model farmer if he is placed under conditions unattainable by the ryot. The farm should show a ryot what can be done *by himself;* the improvements should be reasonable and such as the ryot can adopt; it is no use spending 10,000 rupees on 115 acres and then saying that the land is not good enough, seeing that it is far better than that of lakhs of ryots and has received capital which few ryots can even dream of. It is the example of the restoration of deteriorated soil by means within the ryot's reach, of good farming under the ryot's conditions, or that he may reasonably obtain, that is wanted; it is a comparison of methods, results, capital and profits under comparable conditions, that a model farm should supply. Besides, it is not clear why it was not possible to demonstrate a good system of farm management, even if soils were poor; the proper manufacture, storage and application of manures, the collection and utilization of waste matter as manure, the results of better cultivation in times of drought, the use of better implements and selected seed can surely be shown on a model farm, so that ryots may learn good management to their own profit in practice. It may be added that the proximity of a great city, with its unlimited market, was an advantage that outweighed any defects in the soil. To sum up, a model farm for India is not necessarily or advisably a farm showing the highest ideal of development in high farming, with abundance of capital, but a farm showing the ryots the best methods of management under existing conditions and the profitable improvements that may be effected by themselves by such labor, capital and other means as are open to them in actual practice. This is done at Glasnevin and may be done here, as suggested by Mr. Benson; see paragraph 41 *supra*, where he suggests small farms beginning work on native methods and working upwards to and through a higher practice. The balance sheet of the farm in 1876 was as follows:—

	RS.
Original cost of the land (111 acres)	3,426
Cost of buildings, roads, &c.	6,000
Balance to debit	5,920
Total ..	15,346
Total cost per acre	138
Probable selling price	140

The balance to debit was struck after deducting all returns, including Rs. 2,721, obtained at starting the farm from sale of timber cut down.

43. Having thus traced the history of the department and of the Saidápet Farm, it remains to mention the points specially ordered for the consideration of the Committee; improvements, actual or probable in seeds, implements, cattle, sheep and horses, and methods of tillage are specifically mentioned.

44. *Seeds.*—It cannot be said that much has been effected in improving seeds. For many years, seeds have been obtained from abroad or elsewhere and distributed through the Presidency; such were Carolina paddy, sugar sorghums, reana luxurians, cotton, tobacco, maize, &c. The result has been practically *nil* and in 1883 Mr. Robertson said that if beneficial results were measured by returns, the outlay, small as it is, was not justifiable. Mr. Benson also observed in 1884 that the results were unsatisfactory and that it is doubtful whether any good ones will be obtained till they are carried out by persons better fitted for the work than the ordinary taluk officials; he advised local experimental farms. General Cotton had in 1868 pointed out that Collectors were too busy, ryots too ignorant and every one—not an expert—too unskilled to permit of private experiments, and Mr. Robertson added the ryots' poverty, the demands of their own farms and want of confidence in the objects of Government, as additional reasons; he further suggested larger grants for seeds and

Papers in G.O., dated 18th July 1883, No. 878, Revenue.

the grant of prizes for produce as proposed by him and duly sanctioned by Government in 1873; in that year the prize system was for grain in the sheaf and threshed, but he suggested that the best way would be to give prizes for *the actual crops on the ground.* He also pointed out that the prizes offered in 1873 (60 prizes aggregating Rs. 800) were hardly utilized as seed was not available, and that no further trial was made; he also proposed to distribute only one kind of seed for a year. But he pointed out the necessity for district agriculturists as proposed in his letter, No. 620, dated 15th July 1877, to aid the ryots (see paragraph 17 *supra*). Government granted a sum of Rs. 1,000 for seed distribution and left the details to the department, observing that the fact that previous arrangements had not been judicious was no reason for stopping the experiment and that there should be a proper selection of the recipients, such as Messrs. Sabapathi Moodelliar and Krishnsawmy Moodelliar. The old system then went on, viz., the issuing *gratis* of various quantities of seed according to indents from the districts; the results of the experiments were then reported and commented on. In the report for the year 1886-87 the Board remarked that the seed experiments in the districts were generally failures, and Government suggested the limitation of distribution of seeds to those who would take an interest in the experiments. The two great exceptions to the ill-success of seed experiments are those of barley on the Nílgiris (1886-88) and cotton in Bellary (1882 and subsequent years). The former is a Government experiment with English and Punjab barley and was highly successful, especially with the English seeds. The crops were grown by the Badagas. Success is doubtless due to the fact (1) that there was a great local demand for barley for malting purposes, (2) that an Agricultural Inspector was detailed to watch and help the ryots for six months. The barley rapidly deteriorates and new seed will be frequently required; possibly this is the case with all Indian crops, and new or pedigreed seed might work wonders. The other was a private experiment by Mr. Sabapathi Moodelliar who tried several cottons, including Surat and Broach; the latter was the most successful and 20,000 acres are now supposed to be under this cotton, which when new gave about $\frac{1}{3}$ more lint and of better quality than the country cotton, but requires earlier and thinner sowing. This experiment is parallel to that with Bourbon cotton by Mr. Fischer in Erode early in the century.

G.O., dated 5th July 1873, No. 694.

45. Broadly speaking, the reasons for failure or uselessness in district experiments were—

(1) Want of technical knowledge by experimenters, whether Collectors or ryots;
(2) Want of interest by the actual experimenters, usually ryots who undertook the business by order;
(3) Positive objections by ryots who actually incurred odium by trying newfangled experiments, or who objected to use their lands for the purpose of, as they supposed, testing its outturn; or to the expense and trouble of the experiment;
(4) Want of control over the conditions of the experiments, so that many were rendered useless by causes beyond control;
(5) Bad selection of localities or experimenters;
(6) Wholesale conduct of petty experiments instead of a few well chosen attempts;
(7) Want of proper instructions, want of proper attention, failure to notice details, inability to report results properly;
(8) Absence of data for comparison with indigenous crops grown under the same conditions;
(9) Bad seed;
(10) Unsuitability of foreign seeds to their new environment.

All these and other reasons are found in the reports, especially in Mr. Robertson's note on the experiments with Carolina paddy (1877). Experiments are still conducted in much the same way, viz., by distribution to Collectors, and are therefore open to the same objections. It is also to be noted that, as there is no seed farm or

depôt, it is difficult and costly to get good seed in sufficient quantity, and when obtained it is not acclimatized and therefore, in the case of exotics, is frequently a total failure.

46. The history of seed distribution shows the need of a proper organization; there are no farms for the experimental or commercial growth of good seeds; there is no machinery for distribution except the Ulyssean district revenue staff; there are no local societies to call attention to needs and to influence and guide the local ryots; it is much if there is even a single person to help; the ryots are personally careless of mere experiments and are even averse to them as savouring of radicalism and official annoyance in the demand for results and reports; there are no prizes—not for mere pounds of grain, but—for the *crops* grown by the new or improved seeds. The distribution of a few thousand pounds of various seeds among 30 millions of people can have no practical result, especially when largely failures and seldom if ever repeated by the same persons, or in the same places, or with the same class of seeds. Nevertheless, the yields of some seeds, such as maize, Madagascar paddy, Planters' Friend, and varieties of cotton, were in some instances so encouraging as to show what might be done.

DISTRIBUTION OF SEEDS.

Period.	Cotton.	Foreign paddy.	Sugar sorghums.	Maize.
	LB.	LB.	LB.	LB.
1869—82 .	6,833	22,364	6,901	5,811
1882—88 .	5,291	546	3,882	6,072
Total ..	12,124	22,910	10,783	11,883

DISTRIBUTION OF SEEDS—*cont.*

Periods.	Cholum.	Barley.	Wheat.	23 other seeds.
	LB.	LB.	LB.	LB.
1869—82 .	831	..	325	491
1882—88 .	466	2,179	6,830	4,656
Total ..	1,297	2,179	7,155	5,147

47. Mr. Robertson has pointed out the following as objects of seed distribution:—

(1) The encouragement of improvements in the ordinary crops.
(2) The introduction of ordinary crops to localities probably suitable, but not as yet growing them.
(3) The introduction of exotics.

The first object includes the selection of the finest seeds of the best varieties, the system of pedigreeing and the introduction of better varieties of the same staple; the second and the third are self-explanatory. The question is the method and machinery available. It is asserted that much of the faultiness and patchiness of crops is owing to bad seed. It is not necessary to go from village to village to see this; almost any field will show the most marked patchiness even down to contiguous plants; as it is unlikely that a field is so extraordinarily uneven in the quality of its soil, much must be put down to faulty seed; either good seed has deteriorated by long use on the same soils, or care is not taken to select the best seed; much of the badness of crops is doubtless due in this, as in other countries, to want of care, though this may not be altogether wanting. To keep up a supply of good seed and to establish better qualities, regular seed farms are necessary; farmers, as a rule, will not or cannot take sufficient care even if they know the necessity; especially is this the case in the matter of improvement by selection and pedigreeing, which has given such successful results elsewhere. In the absence of private effort, only Government farms are possible and these are not now available. Again, it is pretty certain that large areas will grow better crops than they now grow, or garden crops in place of ordinary, cheap cereals; hence for interchange, there must be method and machinery; officers to inquire, to collect and to distribute. Similarly in the matter of exotics; as pointed out above, exotics which are not necessarily strangers in genus but only in family, such as Sorghums, Carolina paddy, &c., may and do thrive luxuriantly and profitably; but for their introduction, there must be officers of wide knowledge as well as local experience to take cognizance of suitable crops and suitable localities for experiment. Finally there must be local men of influence and public spirit who will call attention to these needs and will spread the knowledge of the methods and seeds available and

encourage or try experiments; there must also be ryots willing and desirous of getting and trying new products. Few at present are available, such as Messrs. Sabapathi Moodelliar and the late Krishnasawmy Moodelliar, but local societies would surely bring forward other such gentlemen, especially if encouraged by the operations of local experimental farms. The importance of new varieties is shown by experience; *e.g.*, in France new wheats have, in certain localities, raised the average produce from 13 to 27 bushels per acre; in this Presidency 4 months' paddy has, with equal or even superior outturn, occasionally taken the place of a 6 months' variety, thus partly avoiding the risk from uncertain irrigation, or permitting the cultivation of a second or a catch-crop.

48. *Implements.*—The subject of implements has attracted much notice from a very early period. In his Minute of October 1863, Sir William Denison advocated the introduction of certain implements and machines for exhibition to the ryots, as he considered that those they possessed were very inefficient, and application was accordingly made to the Secretary of State for a supply. Early in 1865 arrangements were made for turning to the best account those supplied in reply to the requisition and most of the machines were either distributed to Collectors and a few gentlemen, or sent to the Remount Depôt at Hosúr; a set was, however, detained for exhibition along with the steam-plough imported. The last-named machine was tried in several places with unsatisfactory results and in 1869 a report on it was ordered to be referred to Major-General Cotton for remarks, but there is nothing to show that any report was received from him, for the machine continued to lie at Saidápet till many years later. The experiments referred to in the papers quoted above cannot, however, be said to have done more than excite a considerable amount of official attention to the matter of improving native implements of husbandry. The implements comprised a steam-plough, several sorts of English ploughs, harrows, horse-hoes, seed-drills, scythes, water-lifts, winnowing machines, chaff-cutters, rice-hullers, &c. They were selected by General Cotton who had an intimate acquaintance with India and with English agriculture, but the mistake was made, as in other cases, of assuming that English implements were suited to Indian conditions; the steam-plough was far too expensive to work, the ploughs were generally suited to strong horses, the water-lifts were inefficient, the seed-drills expensive and heavy, the rice-hullers and winnows not required. Some ploughs were however successful in the outturn of work and the Board and Government hoped that the introduction of the more approved implements and the *frequent use of them* would give an impetus to improvement. Since that time various implements have been introduced, tried and modified. At the Saidápet Farm considerable attention was directed to machines and implements and in 1868 the Farm Committee applied for permission to keep a stock of implements for sale. In 1869, they appear to have begun to manufacture tools for sale and in 1870 workshops for the manufacture of implements and tools to meet the local demand were started, which were maintained until the year 1879, when they were closed, as it was not considered right that Government should interfere in the trade. During three years, large numbers of implements, &c., were sold from the Saidápet Farm and many were experimented with.

G.O., dated 27th February 1865, No. 424.

G.O., dated 1st June 1869, No. 1532.

49. The implements chiefly tried are ploughs and water-lifts. In the matter of ploughs there have been Saidápet Farm trials with all classes of ploughs, including those sent by private firms as well as English ploughs and those manufactured on the farm; ploughing matches for farm laborers and public matches occasionally till 1879 and thence regularly till 1885; at agricultural shows, the public have seen many sorts of ploughs side by side with native ploughs both in the showyard and in the field. Numerous ploughs were sent to District officers for trial and exhibition, among which were the Swedish ploughs of which Government imported several hundred, which were distributed for trial. These did good work, but were not entirely suitable even for heavy work. Mr. Sabapathi Moodelliar of Bellary also imported a large number of these ploughs, finding that there was a demand for them on the

black soils of Bellary, and after strengthening them, sold them to ryots. A recent development is that of travelling demonstration parties. The first attempt at such a demonstration was made in the Trichinopoly district in 1879, but was then a failure, owing to the want of a proper appreciation of the needs and ideas of the ryot. In 1885, a student of the Agricultural College, with some assistance from the department, conducted a successful demonstration in the Tinnevelly district, which led up in the following year to a regular travelling show being organized by the department and sent to travel through parts of the southern districts. This show was repeated in the following and in the current year, the shows in both cases going over almost entirely new ground. The latest experiment was that of a match in which the winning plough costing not more than Rs. 6 should get a considerable prize (Rs. 200); this was recently carried out at Saidápet.

Year.	Travelling shows.		
	Number of districts visited.	Number of ploughs* sold.	Remarks.
1886-87 ..	5	262	The actual cost cannot be ascertained, the expenses being distributed under several heads.
1887-88 ..	3	100	
1888-89 ..	4	*320	

*Indented.

50. Considerable interest has now been awakened among officials, manufacturers, and ryots in the matter of new ploughs, an interest not always successful in results; ploughs have been tried which suited neither the soils, the cattle, nor the ryots' wants and purses, nor the means of repair; hence many failures and suspicions that the country plough was as good as need be, or on the other hand strong statements against the ryot as obstinate, boorishly ignorant, wilfully blind to his own interests. The reasons for failure hitherto seem to be (1) want of suitability to the ryots' requirements, (2) price, (3) weight and draught, (4) difficulty of repair, (5) want of proper demonstration.

51. As regards the first point, much has been done both on the farm and more recently by private firms, some of whom have studied on the spot the ryots' needs, and are endeavouring to meet them; one firm has filled large orders and is engaged in perfecting still better ploughs. It is observed that the suitability of the turn-over plough has been questioned; the ryots not infrequently doubt the result of inversion. Professor Wallace considers it probably a mistake to invert Indian soil and would prefer the action of the native implement, if improved in make; Mr. Scott of Madura objected to its use on wet lands as tending to ruin the surface of fine, alluvial deposit which is the product of years of tillage. It is, therefore, not a matter to be decided off-hand. But a better plough, working quicker so as to economize moisture and permit deeper tillage with the same labour and time, thereby saving great breadths of crop and increasing the outturn, is a primary necessity. It may be remarked that all history is against the idea that the present native plough is in the least a final form, or one suitable for a progressive agriculture; it is the form in use in all *primitive* systems, whether in ancient Egypt or in more modern Europe, and has been regularly abandoned as agriculture developed. The second difficulty is one that will not be wholly overcome till agricultural arithmetic is proved to demonstration; as observed by Colonel Thompson in 1864, ryots will purchase a plough or other implement readily, if they see *clearly* that they could save or make money by it, but that otherwise neither influence nor talking nor exhibition nor, it may be added, even field trials, if only casual, will be of any avail. Mr. Logan said much the same in 1869 and the Board have reiterated the same opinion. Mr. Sabapathi Moodelliar's experience also proves that expense is not a material object to the ryot; if he is convinced that Rs. 65 for an English plough will be well laid out in the efficiency of its work, he will pay it; Messrs. Massey's latest experience is that a heavy and expensive iron plough is really sought for in the localities to which it is suited. It is really a question of demonstration.

Read in G.O., dated 6th December 1864, No. 2206.

52. The third difficulty is not generally reasonable; the weight of a plough is not always greater than that of the indigenous pattern, and, weight for weight often does more work. The draught is frequently much less in the improved patterns.

As for repair, this can be got over by training special smiths, but will be overcome locally as soon as there is a real demand. In Uravakonda of Anantapur district, where there are 40 or 50 large iron Swedish ploughs, the ryots actually bear the expense of taking the ploughs to Bellary (30 miles) for repair, but were lately discussing the propriety of getting a trained smith.

53. The last point is the chief one. Farmers in all countries adopt with much difficulty what seem to be obvious improvements; of English farmers, Mr. Prothero writes * as follows:—

* "Pioneers of English Farming."

"By immemorial custom in Gloucestershire, two men and a boy with a team of six horses were employed for ploughing. Mr. Coke sent a Norfolk ploughman into the country, who, with a *pair* of horses and a Norfolk plough, did the same amount of work in the same time. But though the annual expenses were thus diminished by £120, it was twenty years before his neighbours profited by the lesson. In 1780, a Norfolk farmer settled in Devonshire where he cultivated turnips on the newest methods. His crops were larger and finer than those of other farmers; yet at the close of the century, none had followed his example." Mr. Benson also mentions in the report of his Cuddapah tour an apt story of the small English farmer who, ploughing with four horses in a line, was shown how to do the same work with only two horses by harnessing the two abreast, but objected that "those new fangled improvements are too expensive for a poor man." It is, from analogy, certain that nothing but the most convincing and continuous demonstration will convince the ryot; success must be proved not merely absolutely but to the perception of the ryot. Hence, the Board most strongly advocated not mere casual ploughing matches to show that good ploughs will turn over a larger amount of soil in less time than the native plough will stir it, a fact which is admitted, but that the *total results* are better, and this can only be done by proving a better produce by competitive farming matches or "agricultural contests beginning with the ploughing and ending with the reaping of the crop;" to which it may be added that the contest should be over a series of years so as to test the effect whether of inversion of the soil or of deeper tillage, or of both combined, and to show the incalculable benefit of rapidity of operations in places or years of scarcity and discontinuous rain. For this purpose, the Board strongly recommended experimental farms in order to ascertain the actual results, seeing that if the results were obviously favorable, it would go far to spread the use of better ploughs. As a matter of fact there is some evidence both in this Presidency and in the North-West Provinces that increased outturns of from 15 to 20 per cent. have followed the judicious use of improved ploughs, and the effects of rapid and deep tillage in years of bad rainfall are beyond doubt. Mere casual shows, however, whether at exhibitions or travelling, are insufficient; it requires long years of visible experiment and demonstration. The Board's plan was negatived on the ground that "model" farms were not desirable; but it is to be observed that, though demonstration was to be result, the chief object of the farms was experimental, viz., the ascertainment of genuine needs and results. Moreover, such farms or depôts would be necessary to train ryots and smiths in the use and repair of these new ploughs; these difficulties, but especially those of repairing new ploughs, have tended to discourage their introduction.

Board's Proceedings, dated 17th May 1884, No. 1675.

54. If the experiments proved to be successful, the chief difficulty in bringing the ploughs to the ryot's notice would disappear, but it would be necessary to make frequent and local demonstrations, for which Government agents would be necessary. The case of sugar-mills is not parallel; the results of these are easily demonstrated; the questions are simply how much cattle labor, juice and jaggery from a given weight of canes, and these obviously visible facts can be easily compared with those of the country mill. As shown above, the results of new ploughs are complicated and require incessant experiment and demonstration; this, it is impossible to expect private firms to carry out.

55. Sugar-mills have been successfully introduced; the first Beheea mill was obtained at the farm and after trial exhibited at Bellary; its advantages are so obvious that it has been largely adopted, and private firms may be left to exploit the country.

56. Water-lifts are entirely in the experimental stage. The double mhote has been highly spoken of, but never adopted in the districts even by those native gentlemen of wealth and position and landed estate, who officially spoke of it in such terms as that "one bullock did the work of three;" it has even been removed from gardens and topes when given on lease, in order to make room for the country mhote. At Saidápet, it is much believed in, and Mr. Robertson pointed out the immense saving, arithmetically, to the ryot, viz., 20 lakhs per annum in Coimbatore alone, if he would but adopt it. It is obviously a case for very careful experiment and demonstration; if even one-tenth of this could be saved, the boon would be immense. Other lifts have either failed, or not passed the small model stage. An American plan for cattle after the fashion of the tread-mill (inside a wheel) was spoken of in an early report but was not obtained for trial.

57. Other implements of probable utility were the grubber, the chaff-cutter to save fodder and the loss of animal energy in digestion, the scythe armed with which an English mower in a heavy field nearly beat 22 women armed with the country sickle, though they were stimulated by a high reward, the rice-winnower, &c. None of these implements has ever been successfully introduced for want of complete trial and demonstration at work. No cotton gin for hand power has been introduced to oust the native churka.

58. One striking feature is that ryots are as opposed to the introduction of indigenous implements from another district as to totally new European implements; this goes to show that it is custom and prejudice that stand in the way as much as unsuitability, real or alleged. The Coimbatore and Trichinopoly ryot entirely rejects the seed-drill, the bullock-hoe, the big plough of the Ceded Districts; yet the gravelly and highly stony soils of Anantapur are at least as difficult for the drill as those of Coimbatore; speaking generally, the soils of the one district bear a close comparison with those of the other; yet in one the labor and seed-saving drill, with its numerous other advantages, is always in use, while wholly refused in the South. On the black soils of the South, no ryot ploughs with two, let alone ten, pair of bullocks and the use of the big plough is therefore unknown; when weeds get too bad, the crow-bar wielded by coolies is the only Southern implement, so that the sub-soil never gets the stirring and aëration which are universal in the Ceded Districts. Here, then, are indigenous advantages, apparently proved to demonstration, which are elsewhere neglected or refused for want of trial or demonstration.

59. *Stock.*—It seems to be agreed on all hands that not much has been done to improve cattle, sheep and horses. There have been many difficulties, *e.g.*, that all experiments were at Saidápet by officers who had not sufficient opportunities of district study; that imported cattle were favoured without an equal consideration of indigenous stock; that time and money were insufficient; that instead of being the sole duty of a special officer and staff, it was but one item on a general farm, the officers of which were occupied in much more than mere farming duties. Exhibitions, especially those in the Nellore district, are said to have had some effect in promoting the development of a few herds of especially fine cattle, though this is denied by one of the Collectors of Nellore. The Saidápet Farm also conducted some experiments with Aden cattle, and the produce or stock of the farm was distributed on the closing of the farm to various places. The Saidápet breed of sheep was a decided improvement; in 1872 Mr. Robertson reported that he had bred sheep weighing 110 to 120 pounds as against an average of 40 to 50 pounds in country sheep; this was by judicious selection among the Saidápet breed, which was a mixture of various country breeds: 45-lb. weight of mutton worth Rs. 11, instead of 20 lb. of coarse mutton worth Rs. 2 or 3 were easily obtained. The breeds used in crossing were those of Nellore, Mysore, Coimbatore and Patna: there was no foreign blood in the sheep, and they were "perfectly hardy and quite fitted for the hottest climates." The wool was also appreciably finer, worth nearly 1s. per pound in the London market, and nearly as good as Australian and other wool of the same class, viz., "broken pieces and locks," *i.e.*, not in whole fleeces which are worth double the above value. Apart from the Amrut Mahal stud kept up for Government purposes, pony-breeding mentioned below, and the newly started stock depôt, no other operations have been undertaken. It is strange that nothing has been done in the way of improving goats;

these hardy animals are at present chiefly used as manure producers and for milk to a small extent; they live on scanty and coarse food and thus help to manure arable lands at the expense of waste lands. The milch breed of goats has not been developed, though, as pointed out by Inspecting Veterinary Surgeon Shaw, the Maltese goat will yield several bottles of good milk per day, or considerably more than a common country cow. In his report for 1883-84, Mr. Mills (Inspector of Cattle Diseases and Stock) mentioned that he had obtained specimens of the Arab goat from Hyderabad and was crossing them with the Cashmere breed, with a view to add the powers and symmetry of the former to the milking powers of the latter. The result is not known.

60. In an order of 1884, Government observed that the ryots should be influenced by example in the matter of live-stock; that the more such examples could be multiplied, the better; that rams, for instance, should be distributed not by dozens, but by hundreds, to such as would be likely to utilize them, and that every assistance should be offered to those who may wish to engage in stock-breeding. The Director then suggested a stock-farm for the introduction of good breeding stock, and part of the stock of the Saidápet Farm was retained for the purpose in 1885. Inquiries were then made and a site finally approved near Hosúr (Salem), of about 1,260 acres, with a good water-supply, climate and moderately good soil. The object of the depôt as defined by Government was, "with the exception of a few experiments in crossing the various breeds, not to breed stock, but to collect and rear bulls, which, when fit, will be distributed in localities where it is deemed desirable to attempt an improvement on the breed of cattle," especially in places where cattle have "degenerated in connection with both draught and dairy purposes." This was reiterated (G.O., No. 1103, dated 25th November 1887) when the Board wished to engage in actual breeding operations at the depôt, a plan which Government negatived, though they subsequently sanctioned the experimental breeding of sheep. This appears to be the "stock-farm" alluded to in item 5 of the Government Order appointing the Committee. In the report for last official year, the Board reported that the stock were transferred from Saidápet in December 1887, since which time a few purchases were made, and the Amrut Mahal cattle moved from the Palnis and Devikulam; they observed, however, that it would take years to expect any results, and that, to ensure success, the utilization of the bulls sent out to the districts must be watched by the district officers, and efforts made to induce ryots to castrate inferior stock. It is not clear how the existing staff of district officers were to supervise these operations; clearly such very special work would require special officers, such as agricultural or veterinary inspectors, or, if possible, an experimental agricultural station. The last 20 or 30 years have at least been fruitful of one lesson, viz., that special agricultural problems and experiments *cannot* be carried out by the ordinary district staff; time, knowledge and frequently interest are all wanting; amateur work is seldom successful in anything, least of all in agricultural matters, especially when the experimenters can give but occasional supervision. It is also clear that without plenty of time and money nothing can be done; it is not worth while to have a depôt for a score of bulls, as the results would be inappreciable; as observed by Government, to be of any effect, rams must be sent out by hundreds and those to selected and restricted localities. It is equally obvious that many years are needed to produce any results.

G.O., dated 19th December 1884, Nos. 1412, 1412-A., Revenue.

G.O., dated 11th May 1885, No. 547, Revenue.

G.O., dated 7th June 1888, No. 386, Revenue.

Year.	Stock depôt.			
	Horned cattle.	Sheep.	Total cost.	Remarks.
			RS.	
1886-87 ..	33	113	787	Closed by order of Government, No. 803, dated 19th Nov. 1888.
1887-88 ..	38	89	4,092	
1888-89 ..	31	69	1,534	

61. The question then arises "whether the breeding of stock can be properly or economically carried on by Government." It is not quite clear whether the word

"properly" means whether it is the proper duty of Government to engage in stock-breeding or whether such an enterprise can be carried out by Government with skill and success. Taking the first view, it is considered by some that in this country it is eminently the duty of Government to take up the business; that cattle are inferior and miserable; that the ryots require good examples before their eyes; that unless good stud-stock are supplied from time to time, the breeds will not only not improve, but will still further deteriorate; that, till good cattle are used by the ryots, improved cultivation cannot take place; hence that the improvement of agriculture waits on Government operations in cattle-breeding. It is replied by others that cattle-breeding is very well understood by ryots in the country; witness the myriads of splendid cattle to be seen at the various indigenous cattle fairs, the excellent cattle in myriads of carts and in the hands of the ryots in places where the cultivation requires them, as on black cotton soil; that mere example or even the ability to obtain better cattle is not a sufficient inducement, as exemplified by districts where the most excellent breeds exist in the very midst of or side by side with the most ordinary and miserable cattle in the hands of the ordinary ryot; that the supply is limited only by the demand; that the demand is small because agricultural practice is low and feeding difficult; that where soils are light and open, as over millions of acres, a small class of cattle do all that is required and at all events are all that the soil could support under present inferior practice as regards the feeding of the calves, hot weather and other supplies of fodder and pasture; that in fact it would be useless and unwise to supply good cattle where the practice is so inferior: hence that it is necessary to improve general practice and treatment and that this will bring about the demand; in other words, that conditions and practice are at present suited, and that cattle can only improve by better practice and better conditions of rural economy. For instance in the wet lands, the strain on large and heavy cattle sinking deeply into the puddle might endanger them, so that ryots are unwilling to risk such valuable cattle on wet lands: again, it is very general for wet lands to be held by ryots who do not actually cultivate, but do so by Pallars who are paupers, living from hand to mouth: these people cannot afford good cattle, but buy the cheapest and most miserable, which, moreover, cost much less to feed both when at work and in the idle season: this point is borne witness to by general experience in river-villages and by the express and graphic statements of the late Mr. Krishnasami Mudalliar of Shiyáli. Moreover, it is agreed on all hands that so long as the common-herding system prevails, so long will cattle be a mixed and degenerated lot, the produce of immature bulls of the lowest type and common village cows of an equally low class; a "promiscuous union of nobody's son with anybody's daughter." So long as the common waste lands and village cattle stands are frequented by "half starved cattle and sheep, a disgrace to their respective breeds, a fruitful cause of disease, no individual farmer could improve his breed of live stock" (Prothero). This was the condition of most of the English farming in the eighteenth century and it could not be much mended till enclosures were universally adopted. Hence, it is argued, it is useless to expect any material improvement of stock under present conditions and practice; Government may spend a great deal of money, but so long as it is not possible to ensure proper feeding, proper treatment and proper breeding conditions including early castration of less useful bulls, the Government bulls will have little effect; the conditions of village practice must limit the success of Government operations. These are the arguments of those who doubt the value of Government attempts to improve the ryot's stock without his sympathy and active aid. The objections of course do not weigh where large numbers of cattle are required by Government themselves for special, *e.g.*, military purposes; hence the origin and usefulness of the Amrut Mahal stud, the Hissar Farm of the Punjab, &c.

Papers in G.O., dated 28th June 1882, No. 650, Revenue.

62. If it be considered that Government may, with propriety, engage in this operation, it seems obvious that operations must be on a very large scale, costly, continuous and lengthy. If they are not on a very large scale, they will be useless, for it is otherwise impossible to affect twenty millions of stock; whether bulls or rams they must be distributed not by tens but by hundreds or thousands. Moreover,

since the chief superintendence must in any case be costly, it will be relatively cheaper to act on the large than the small scale. Operations must consequently be costly; an expenditure of lakhs of rupees is needed to effect any appreciable benefit. Moreover, stock-breeding is a matter requiring much knowledge, not merely of beasts, but of breeding, of physiological and other science, and of the requirements of the country; hence expensive superintendence. And as it is hopeless to see results before several generations of cattle, and as it is absolutely useless to begin, to discontinue, and again to begin operations, they must be continuous and lengthy.

63. It may be well here to discuss the query as to economy. It is doubted by all the experts whether Government can make stock-breeding a *commercial* success; the cost of all Government operations is great, failures—the matter being an experiment—are probable, cost of superintendence heavy, the demand for expensive stud bulls—expensive, because expensively reared in such a farm—may not equal the supply, so that stock may have to be sold at a loss. But, on the other hand, it is argued that economy and commercial success ought not to be looked for, seeing that the operation is for the good of the country; stud cattle of real value would be so useful that Government would be justified in establishing them at a loss. Obviously the question again recurs whether it is necessary that Government *should* attempt stock-breeding: seeing that cattle so largely comprise the wealth of the country and are so prized by ryots, is it not probable that demand will be met by supply? Cannot any artificial stimulus that may be necessary be applied, on the one hand, to indigenous breeders so that they may increase the supply, and to ryots so that they may demand better cattle? And should not Government operations be confined to mere farm experiments and to the introduction of better breeds whether from other parts of India or from other countries? Reasons have been given in paragraph 61 for thinking that supply waits on demand and on better practice; there are many large breeders in the country, such as the Palayakottei Pattagar, of Erode taluk (near Kangyam), who sells hundreds of fine cattle per annum; his relations are similarly engaged; there is the owner of a thousand cows in Nellore; while petty breeders may be met with everywhere in Coimbatore, Salem, North Arcot, Nellore, &c.

64. Probably, it may be considered the safest and most economical plan not to breed but merely to select and distribute suitable sires, the breeds being carefully selected to suit the several localities, the indigenous breeds, &c. This was the principle of the stock depôt near Hosúr started in November 1887 and abolished at the end of 1888. Good breeds could possibly in this way be perpetuated and developed, and inferior breeds improved. But great local knowledge and, therefore probably, local depôts would be needed. It has been suggested that it would be absolutely necessary to induce ryots to castrate their young bullocks, if good sires are supplied or otherwise available; the difficulty here lies (1) in its being against custom to castrate till three years of age; (2) that too early castration is said to weaken the bullock and unfit it for severe work, or for the full work it would be capable of, if castrated at the usual time; (3) the immensity and difficulty of the task; it may be possible enough to obtain the castration of a few score country ponies when good Government stallions are easily available for the mares, but to persuade or force a million ryots to alter ancestral customs as to castration and breeding, even if there were Government bulls in every village, is a very different matter. It is not sufficient *as yet* to provide good stud cattle; a ryot will not alter his custom on mere suggestion; as stated by Dr. Shortt in 1874, a native herdsman is careless in such matters even if there be a good bull in the herd; on two occasions he provided excellent stud bulls, but met with absolutely no aid, though service was entirely free. If this is the case when an officer of experience, accustomed to the country and well known to the ryots, personally undertakes the experiment, it is unlikely the Government bulls will meet with much success, or with success at all commensurate with the task, or that their mere presence in a village will induce the ryots to give up their ancient custom as to castration and trust to the Government bull.

65. But it is doubtless possible, and probably advisable, to apply a stimulus both to breeders and ryots. This has been one object of exhibitions; opinions are

conflicting as to whether exhibitions *have* stimulated the breeding of fine cattle; evidence, properly so called, there is none on this point. Rewards and prizes at indigenous cattle markets have also been suggested; honorary rewards are possible, but these cannot be scattered broadcast without becoming too cheap and probably therefore useless. Practically it would seem as if the operations of local societies (to be hereafter mentioned), local farms and better general practice must be depended upon. The department might possibly experiment in crossing various breeds, whether for draught or milk, or both, and in bringing new breeds from outside the Presidency; at present it is impossible for private breeders or societies to undertake the latter. But until the best specimens of local cattle have received full attention, this will not be often necessary. Such attention has not yet been paid to indigenous breeds; from the Saidápet records it is clear that specimens of the best Punganúr breed were never obtained, the miserable specimen there called Punganur being not really representative. Similarly, Mr. Robertson in Coimbatore clearly never saw the real Kangyam breed; those of Meycheri (Salem) and Tiruchengód are well known to private buyers. Really good specimens of these cows will certainly match Aden cows in milking results, and there are numerous breeds of excellent draught cattle. It may, however, be suggested that in view of the facts that the best milkers of Southern India do not yield above one-third of that of the best foreign cows, and that dairy produce is of such great dietetic and other value, some special attention should be paid to the subject of eventually introducing really good milch cattle, as from Australia.

66. The questions of fodder and pasturage may be considered here. It does not appear from the papers that there are two opinions as to the miseries of the ordinary working cattle caused by want of proper food during the dry part of the year. In England (as in other countries) the same difficulties occurred in the cold wintry season, when English practice was, as formerly, similar to Indian, viz., when all ordinary cattle depended on the straw of poorly-grown crops, and on the grass of the common pasturages. Nothing, on the other hand, has more developed the cattle of England, Belgium, &c., than the practice (*a*) of paying as much attention to the growth and cultivation of pasture as to that of cereals; (*b*) of growing special crops for stock, such as roots, &c.; (*c*) of stall-feeding the cattle instead of allowing them to go loose. Possibly the last-named practice is not yet practicable or necessary in India. But there is no single improvement comparable with that of growing pasture and fodder, especially for cattle and especially for use during the hot weather; at present, the supply of fodder from cereal crops being insufficient and the storage of hay—*i.e.*, dried grass—unknown, the cattle starve during several months and feed to repletion when the rains come; hence weakened constitutions, and much actual disease and death. The practice is not indeed absolutely unknown; in Coimbatore, some garden ryots sow cholum and cumbu thickly (adar cholum, &c.) during the hot weather, water it and cut while green: in Tinnevelly, cholum is planted over considerable areas on the black soils and cut at or before flowering, such crops being called "cholum náttu." There are also here and there pastures, *i.e.*, fields in which grass-seeds have been sown and which are then conserved for pasture; or there are fields of natural grass in low places which are equally preserved. But speaking generally, cattle subsist on the dry straw of the grain crops and on the "wild field-grass" system, *i.e.*, by grazing on the common lands of the village, usually, by necessity, the worst in the village. The problem here indicated is one which would, in itself, warrant the existence of an Agricultural Department, and in this matter, the experiments on the Saidápet Farm, which prove that Southern India is peculiarly fortunate in the fodders it can grow, both in quantity, quality and cheapness, are particularly valuable. It remains to ascertain the best method of attacking the problem practically, and it is a serious question whether district experimental farms would not justify their existence even if this were their sole work. Good pasture and fodder seem to be the necessary pre-requisite for the introduction of better cattle. It is historically true of other countries that cattle never flourished so long as dependence was placed on the commons; even village pasture reserves will not fully meet the difficulty. Agriculturists in Southern India have suggested the growth of trees partly for the supply of fodder, as a condition of the patta, but whether it were a condition or not, the development of

such is deemed absolutely necessary by those officers who have examined the country. In this connection it is sufficient to refer to the practice of ensilage which has achieved some success, but is still, in Southern India, in the experimental stage.

67. *Pony-breeding.*—There have been several attempts at horse and pony breeding in Madras, chiefly in the Coimbatore district, since 1829. Some effect between 1831 and 1847 was produced in that district, but at much expense. Another attempt was made without much success in 1870. In 1884, the subject was again mooted by the Collector of Coimbatore and his reference has led to the present development in the districts of Coimbatore and Salem, where there are now ten stallions at work. The budget allotment is Rs. 10,000 per annum. Considerable progress has been made in getting owners of country stallions to have them castrated; at first a present of Rs. 3 for each pony castrated, and compensation up to Rs. 25 in case of death from the operation, was necessary, but the present seems now to be hardly wanted, at least in Salem, as owners are beginning to see the value of castrating ponies. Without wholesale castration, Government stallions can never be of much use.

Year.	Number of coverings.	Number of foals dropped.	Number of castrations.	Cost.	Remarks.
				RS.	
1885-86 ..	68	109	..	692	The results-report of coverings of 1888-89 is due only in March 1890.
1886-87 ..	101		83	5,261	
1887-88 ..	305		355	5,773	
1888-89 ..	378	..	..	..	

68. The object of pony-breeding is not laid down. It was expressly stated by Dr. Shaw and the Director of Agriculture that Southern India is outside the horse-breeding zone, "nor was it ever the intention of Government to attempt more than the improvement of a very fair class of local pony;" in 1888, Government also stated that Madras was outside the zone of horse-breeding operations. Ponies are certainly mere rural luxuries; they are not used in any tillage operation and pack ponies are now practically unknown; for the conveyance of the richer ryot to market or on a country journey, the ordinary pony, hardy, enduring, content with and thriving on scanty food, has accommodated himself to the conditions of the country and serves the ryot's needs. Though poor to look at, they are capable of very long journeys and hard work, as witness the jutka ponies of Madras, Chingleput, North Arcot, &c. So long as money is dear, fares low, and feeding scanty, the ponies in use in town and country will remain poor, and better bred ones will deteriorate. To provide good ponies for supply to towns and well-to-do ryots may be useful, but whether it is a necessary operation for Government is a matter for consideration. Rs. 7,500 per annum on pony-breeding is not in itself a large sum, but it is larger than the original cattle-breeding budget allotment, and the latter has now been struck out altogether; yet the necessity for improving cattle and sheep cannot be even questioned. Ponies are not required for Military purposes, and if they were, the matter should be undertaken by that department. Cattle and sheep breeding is a necessary, pony-breeding a luxury.

Papers in G.O., No. 173, Revenue, dated 9 March 1886.

G.O., No. 209, Revenue, read in Board's Proceedings, No. 146, dated 19th March 1888.

69. *Cattle-disease.*—The history of operations against cattle-disease is as follows:—In 1864, there was much disease in Kurnool, and Mr. Thacker, V.S., was sent on a tour of inquiry. The results were such that he was employed on similar duty till 1871, when he left for England: meanwhile he prepared a Manual dealing with the more common and deadly forms of disease. The remedial measures suggested by him were embodied in Act II of 1866, with a view to their enforcement when necessary: the Act was however only occasionally brought into force. In 1870, the Board proposed a School of Veterinary Surgery to train men for stock-breeding, the treatment of disease, and the collection of information, but Government considered the scheme as premature and that the wide circulation of Mr. Thacker's instructions would suffice. In 1875, however, Mr. Western, V.S., was temporarily appointed till

1876, and showed that no improvement had been effected in the practice of the ryots, and suggested a staff of Assistants to be chosen from the graduates of the newly-started School of Agriculture. Nothing, however, was done till 1881, when Government determined to appoint a permanent Inspector of Cattle Diseases, as a matter of the most pressing importance, the health of cattle being a primary necessity in an agricultural country; they also sanctioned a scheme for selecting and training a staff of subordinate Inspectors from the Saidápet graduates. Mr. Shunker was appointed as an itinerant Inspector, but on the appointment of Mr. Mills, V.S., in 1882, his post was altered to that of Deputy Inspector. Mr. Mills, however, chiefly remained at Saidápet where he was Veterinary Lecturer in charge of training the subordinate staff; he also re-wrote the Manual on Cattle-diseases, now called "Plain Hints on Cattle-disease." In 1884-85, he began to itinerate for part of the year, Mr. Shunker being, however, removed to take charge of pony-breeding in 1886. In 1887, Mr. Mills went to Europe, and in 1888 Mr. Hazelton joined the department. The subordinate staff, now called Stock Inspectors, was first entertained in 1882. By 1886, 18 men had been posted to districts. The method of recruitment and training has not been altogether satisfactory and is still the subject of discussion.

G.O., No. 901, dated 9th June 1881.

Year.	Number of		Total cost.	Remarks.
	Inspectors.	Stock Inspectors.		
			RS.	
1882-83 ..	* 2	9	8,809	9 Probationers.
1883-84 * ..	2	15	23,103	9 ,,
1884-85 ..	2	18	28,008	4 ,,
1885-86 ..	2	20	33,623	3 ,,
1886-87 ..	2	19	39,418	1 ,,
1887-88 ..	2	17	29,447	
1888-89 ..	2	22	†40,000	

* Includes Assistant Inspectors.

† Regular estimate.

70. It will be seen that the operations consist solely in the appointment of Inspectors who have traversed the country observing the diseases and the conditions liable to cause disease and giving such advice and treatment as might be possible. At first there was only a single officer, but of late years there have been subordinates, now called Stock Inspectors, at the rate of about one for each district. Practically, moreover, the diseases combated have been the epidemic contagious diseases, such as rinderpest, anthrax and foot-and-mouth disease: ordinary diseases have attracted less attention, because the more violent and fatal diseases were more than enough for attention. The chief points appearing for consideration seem to be, the prevalence of diseases, the conditions favoring disease, the present methods of combating them, the *personnel* and training of the staff and future developments.

71. Exact statistics are wanting, but the officially-recorded statistics for the chief diseases for the last three years are as follow:—

Year.	Causes of death.					
	Anthrax.		Rinderpest.		All other diseases.	
	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.
1885-86	13,542	11,487	12,109	6,971	100,838	‡ 11,433
1886-87	22,381	18,558	47,491	33,789	111,181	38,228
1887-88	..	36,248	..	121,741	..	33,242

‡ Includes accidental deaths.

In 1887-88, no less than 34,704 deaths were officially reported from rinderpest in South Arcot alone.

72. It is a received axiom that these contagious diseases are not spontaneously generated; witness the conclusions of the Indian Cattle Plague Commission in 1871. They are then communicated, either at fairs and markets, in bandy pettahs, by traffic

along the roads, by the promiscuous herding of cattle on the village commons and grazing grounds, by the pollution of the pastures and drinking water by diseased cattle, by entire want of segregation of cattle in the stables or houses where they are kept even when disease appears, by the habits of certain classes who eat the flesh or skin of such animals, throwing away the offal, &c., on any waste ground, and by jackals, which unearth the only partially-buried carcases and distribute the dangerous matter over the country. Here there is obviously much room for the operations of a department. What are the regulations, if any, which can deal with such cases? how can alterations in practice be effected so as to lessen the causes which disseminate disease? There are also the pre-disposing causes of disease to be considered; cattle, bred from rickety, half-starved, immature animals, starved when young, alternately starved and gorged at various seasons of the year throughout their lives, exposed to inclement weather without housing, feeding on filth of all sorts, including human excreta, so that they are infested with internal parasites, drinking foul water, getting little or no salt and generally living in unclean surroundings; will not such cattle, which may be numbered by lakhs, be pre-disposed to disease, readily receptive of it and consequently highly dangerous to other and better cattle? It seems clear that rural economy, and treatment of cattle in particular, require much attention. The disappearance by the growth of population and other causes, of open pastures (so called), with the extension of fodder crops, and the consequent retention of cattle on the owner's fields; the proper stabling, feeding and watering of cattle; the growth of knowledge about their nutrition and their diseases; the recognition and immediate treatment of disease, especially by segregation; the growth of opinion, partly by teaching, partly by the aid of the law, against the custom of allowing certain classes their usual perquisites in case of cattle which have died of disease, and the regulation of traffic at cattle fairs, are among the general remedies which will arise for improvements in cattle treatment and rural economy.

73. In the way of combating disease, there are available (1) an Act of the Legislature, II of 1866, (2) an inspecting and executive staff, (3) direct preventive methods. Act II of 1866 is not generally in force; it has occasionally been brought into operation so as to give powers to the staff on occasion of very severe outbreaks, the chief use made of it being to establish under its authority hospital pounds and enforce the bringing of diseased cattle to such pounds, which are usually placed in or near large infected villages, along lines of communications; *e.g.*, in Gooty taluk in 1888, nineteen hospital pounds were established. But, as may be supposed, the staff is wholly insufficient (see paragraph 74) to enforce the strict provisions of the Act in large districts, and, in a review of operations in this Presidency, the Government of India, when considering legislative enactment for India generally, remarked as follows:—

"It will thus be seen that the weight of opinions given by the various Local Governments points to the conclusion that legislation to enforce isolation of diseased animals is, under the existing system of administration, premature and inadvisable. Apart from the very important fact that at present there is no agency fitted, either by knowledge or position, for enforcing rules under an Act of the nature proposed by the Punjab Government, there is the further consideration, which has been brought out in almost all the opinions given by the different authorities consulted, that a diffusion of veterinary science is necessary and that until the provinces are provided with a Veterinary staff and the people have been practically convinced of the advantage of protective measures, no real good will result from legislation. On the contrary, premature legislation might seriously injure the movement hereafter, for the evidence now before the Government of India shows that rules of law, however simple, would be likely to irritate and harass the people, without effectually securing the object of diminishing the ravages of cattle disease. Under these circumstances, the Government of India, while cordially acknowledging the assistance which the Punjab Government has given by calling attention to a very weak point in the agricultural economy of India, are forced to the conclusion that the question must be held in abeyance for the present. But the subject is of such vital importance to the agricultural classes that the Local Governments and Administrations should do all that lies in their power to prepare the way for legislation by systematic observation of the diseases of cattle, by diffusing information of the best measures of prevention, and (so far as their means allow) by providing an agency for these purposes and for the treatment of cattle diseases."

74. Paragraph 69 gives a full history of the departmental staff for combating disease. The question is its suitability and training. At present there is one European Inspector and about 17 Stock Inspectors whose pay ranges from Rs. 50 to

150 according to service. Until 1887, the practice was to select Agricultural College graduates and give them a special course of veterinary training for one year as probationers. In 1887, the plan was changed; from the students who had completed one year's course at Saidápet and passed the Preliminary Examination for the Agricultural Group Certificate, men were to be selected as veterinary students and put through a special two years' course of Veterinary Surgery and Medicine (which includes stock-breeding), both theoretical and practical; special inducements were to be given as the Veterinary branch is unpopular and merely a *dernier ressort*. These men, whether trained by the former or latter method, are or will be the Stock Inspectors who are the district staff for combating cattle-disease; one is allowed for each district and one or two as reserve. Now Mr. Benson, who was in charge for some months, and is an expert of long standing, is of opinion that this system is wrong; that more men are wanted and of a different class; they should be less expensive, less highly trained and more practical; more comparable with the class of Hospital Assistants (quære, Hospital Apprentice); men of natural aptitude for the work, well practised in common diseases and in operations such as castration, administration of medicines, and generally in handling stock, and above all, not afraid to and who will not object to carry out such operations; locally recruited and locally employed. He pointed out that 53 per cent. of the Stock Inspectors are Brahmins, to whom operations on the live and dead body are abhorrent, and who, whatever they might do privately at the College, would not work "up to the arms in blood" in district practice, and that they are more inclined to talk and give orders than themselves to set to work, to dress and physic sick animals, to see personally to the disposal of dead carcases, and other matters of veterinary police. He did not believe that, in spite of their long training, any of them could train up a class of rural cow-doctors for rough country work as suggested by Government, owing especially to their weakness in practical knowledge. The Commissioner concurred in these opinions, but considered that the present class should be continued, as men of good veterinary education are needed in each district, and that the others should be employed under, though not necessarily subordinate to, the Stock Inspectors.

Papers in G.O., No. 371, Revenue, 30th May 1888.

75. On the other hand, Dr. Shaw, Inspecting Veterinary Surgeon, Madras Army, considers that no man should be a District Inspector who is not thoroughly trained, and that by the best men; he does not believe in undertrained men, and believes that the ryots would lose the confidence they are gaining. The present Inspector, Mr. Hazelton, is similarly of opinion that all Stock Inspectors should be highly trained, so as to inspire confidence. But he is of opinion that the present class of men, though generally hard working, have not entered the profession from any liking for it; that without a real aptitude and liking for the work, no man can be successful, especially when, as in the case of these Inspectors, they are alone and without advice and supervision, in a large district, contending alone against many prejudices, disheartened by the magnitude of the task, and doing work which they do not care for and which presents serious caste objections. In passing orders on the Commissioner's letter, Government expressed their surprise at hearing of the inferior knowledge of the Stock Inspectors, despite their college and special course, and were strongly of opinion that the first thing was to improve the technical knowledge of the Stock Inspectors, before establishing an inferior grade. It is not clear what steps have been taken for this end, though, as shown in the next paragraph, it is in practical training that the Inspectors are most deficient.

G.O., No. 371, Revenue, dated 30th May 1888.

76. All officers are agreed that the staff is far too small, and has too little practical training. Mr. Mills, late Inspector, pointed out similar difficulties in the practical training of students, especially Brahmins, who declined to handle carcases or operate on the living subject, while the ordinary operations of practical work were equally repulsive to a high caste student, such as stitching and dressing wounds and sores, castrating, making *post mortems*, dissecting, &c.; he considered that men who had

Papers in Board's Proceedings, No. 517, dated 16th December 1887.

caste objections to such work could never be practically trained, though they might read books and pass good written examinations. The work in the districts is that of advising precautionary measures, of actively searching out and treating diseased cattle, of arranging for the proper disposal of the sick and dead, and the instruction of the ryots in cattle disease symptoms and treatment. Their primary duty is active treatment of disease, a matter in which actual practice, actual handling of the diseased subjects is absolutely necessary. Their secondary duty is instruction in preventive measures. The modes of recruiting and training a class of men who have a natural tendency to, or aptitude for, such work, who are not burdened by caste prejudices and who can get a good practical training before leaving the training school, are matters for consideration. As regards the work already done, Mr. Hazelton considers that a good deal has been effected, but that it is not such as can be visibly demonstrated; it is chiefly in the way of establishing confidence and spreading ideas, and both time, a larger staff and more general intelligence and co-operation are needed before results will be actually visible.

77. In passing orders on the system for training Stock Inspectors, Government suggested the training of village cow-doctors to treat the more common diseases; they were to be of the ryot class, adding to their income, as ryots, by treating the sick cattle of their village. At present it is impossible to train such men for want of teaching skill (paragraph 74 *supra*), and it is a question for consideration whether this could not be effected if there were district experimental or demonstration farms; or stations for the treatment of stock, (paragraph 112).

G.O., 1027, Revenue, read in Board's Proceedings, dated 16th December 1887, No. 517.
G.O., dated 30th May 1888, No. 371.

78. There is a mode of combating cattle-disease by prevention, viz., Pasteur's method of inoculation on a principle similar to that of vaccination. This is merely in the experimental stage, but deserves the most serious study, as successful protection against cattle-disease would be far more useful than curing (or failing to cure) it. It is the hopelessness of attempting to cure thousands of cattle all sick at the same time, scattered over numerous villages, owned by men who disbelieve in novel practice or treatment, and forming fresh foci of contagion, that causes the present difficulties; prevention of such attacks—even by inoculation—among even a moderate number would immensely reduce the work of the department if only in preventing the present rapidity of contagion.

79. *Methods of cultivation.*—The next point for consideration is the action of the department in the improvement of the methods of cultivation. Two classes of operation seem to be included here; (1) the ordinary practices of the farm, (2) special practices, such as ensilage, sericulture, tobacco-curing, &c.

80. Not much actual improvement has resulted from the action of the department, though much has been done to ascertain and test improvements, as shown in the history of the Saidápet Farm (paragraph 37 *supra*). Only in so far as the public trials of new or improved seeds, implements, cattle, &c., have awakened interest, and, in a few cases, imitation, or in so far as correspondence with the Saidápet Farm and the interest excited by its operations and by exhibitions have borne fruit, has there been any action upon methods. With the above limitations, tillage, manures and manuring, seeds and sowing, the management of the crop till it is placed in the market, remain as they were, so far as action by the department is concerned.

81. Experiments were, however, devised and begun towards ascertaining the amount of water that actually is and that should be used by ryots. So far back as 1867, experiments were ordered, and in 1872 further orders issued that they should be made in the proposed experimental district farms, but as these were never started, little was done. The irrigation at Saidápet was inferior and uncertain, and though experiments were begun in 1882-84 nothing was actually ascertained before the farm was abolished in 1885. Obviously, moreover, experiments limited to one particular locality, soil and climate, would be very misleading; what would suit a light, sandy soil to perfection, would rot the same crops on stiff soils, while other

G.O., dated 26th October 1867, No. 3668.
" " 13th June 1872, " 1458.

physical conditions, drainage, condition of sub-soil, chemical composition, depth of ordinary working, season of the year, &c., are all most important considerations. In addition to these considerations affecting the quantity of water, conditions affecting the outturn have to be considered, such as the manural condition of the soil, the quantity of seed sown, the seasonableness of the sowing, &c.; the outturn, moreover, must be accurately ascertained and compared with the outturn of neighbouring soils not affected by the experiment. Without these precautions, experiments are useless, seeing that a little more or less water, good or bad seed, late or early sowing, and other conditions as noted vastly affect the outturn, and therefore the conclusions to be drawn. Hence experiments at Saidápet or any other single locality are almost useless; what are wanted are numerous experiments under rigidly regulated conditions in various districts, undertaken and watched by persons able to take note of and allow for extraneous conditions. The subject is one of the greatest importance to Government which has the control of the irrigation sources, sluices, &c., as well as to the ryots; if one acre is now getting what is enough for two, not only does Government lose revenue, but many ryots lose water and therefore the produce they might be getting; less land is protected against famine; a bad and slovenly practice is perpetuated, in that land is swamped instead of being irrigated, manured by silt instead of by labor; in short little is done by the ryot and much by nature. There is a vast contrast between the wet lands of the Tinnevelly river valley or the carefully irrigated and tilled garden crops of paddy in Karúr and the páddy crops of much of the Tanjore delta.

82. This leads to a consideration of experiments in *diversified cropping* by which it is sought to ascertain whether instead of incessant paddy, as in the Tanjore delta, other crops might not be grown not merely with success, but with benefit to all concerned. Probably, the soil would be relieved by a change of crops, so that each crop might yield more abundantly and the chance of fungoid and other disease be lessened. Moreover, as few crops require as much water as paddy, it would, if physical conditions, such as the configuration of the country, permit, be possible to protect a wider area more perfectly, while it is believed that the produce per acre would not merely be at least equal in quantity, but probably contain greater nutriment, *e.g.*, by the substitution of wheat for paddy. As in the case of irrigation experiments, diversity of areas and localities, time, intelligent conduct and reporting of the experiments, and the possibility of superior supervision are essentially necessary. These two last requirements have prevented the experiments ordered in 1885 and 1886 from being carried out; ryots could not be found who would (*a*) conduct the experiments intelligently, (*b*) keep a record of the facts and results intelligently: revenue officers obviously could not undertake these duties; confidence could not be reposed in the Agricultural Inspectors whose want of practical experience would certainly lead to failure, unless under careful supervision; and it was impossible for the one expert available (Mr. Benson) to supervise the various experiments, considering his other duties. Government, therefore, ordered the abandonment of the experiment for the present. The reasons given and the remarks as to irrigation experiments (paragraph 81) apply to almost all other agricultural experiments and point distinctly to the necessity for district agricultural stations, where Agricultural Inspectors can gain practical experience and experiments be conducted and supervised. As pointed out by the Director, men like Mr. Krishnaswami Mudaliar of Shiyáli are not easily found and even he stipulated that in the conduct of experiments, he should not be required to make observations or to maintain a record.

G.O., dated 28th September 1885, No. 1098.
„ „ 25th June 1886, No. 1445.

Mr. Grose's letter in G.O., dated 11th February 1887, No. 156, Revenue.

G.O., dated 11th. February 1887, No. 156, Revenue.

Papers in G.O., dated 25th June 1886, No. 1145.

83. The subject of the drainage of wet lands and improvement of the sub-soil, with the great consequent change in irrigation methods, viz., that of passing the water *through* the soil, has, of course, not been taken up; though apparently of the utmost importance, it involves incalculable difficulties, connected especially with the rights of contiguous landholders.

84. Numerous experiments have been made in *ensilage* throughout the districts; many were successful in turning out good edible silage; it was proved that grass and green fodder could be stored underground for a long time (up to 1½ years has been tried successfully), untouched by white ants, and not exposed to the grave dangers of fire, whether accidental or incendiary, such as are so common in Southern India at certain seasons and especially in certain factious districts. With the experience of other countries as a guide, this result was practically certain; but this is only the first result and the easiest obtained. The questions to which answers are really required are (1) whether, speaking generally, there is grass enough both for grazing and for silage; (2) if not, whether it is better to graze it down when green or ensilage it for use in the hot weather; (3) whether it will pay to grow grass or fodder for storage in silos, rather than grow cereal crops giving both grain and straw; (4) whether, if green fodder is grown, it is better to cut and use it green from time to time, or to store it; (5) if stored, whether, in this country of hot sun and predictable weather, it is better to make silage than hay; (6) whether silage is better for cattle or more profitable, all things considered, than green fodder or hay; (7) whether the increase in weight or milk, described by one or two officers, is due to the effect of silage as silage, or to the animals getting plentiful feeds instead of scanty ones; (8) whether silage is a substitute for other foods or should be only "one ingredient in a suitably balanced dietary;" (9) what is a "suitably balanced dietary" when silage is used. These and other questions remain for answer and are such as cannot be answered by casual experimenters, whose ordinary avocations and whose technical knowledge give neither leisure nor power to answer them conclusively. The very records of the experiments show that with the best intentions officers could not thoroughly work out the easiest part of the problem; at the proper season for filling the silos, the officers were often in camp; the feeding experiments were conducted during their absence or when so busy that they could not supervise them; ensilage was supposed to make nourishing and wholesome food out of plants otherwise objectionable or useless. Obviously, if silage is to be a success, it must be carefully and continuously tried by officers of knowledge, experience and leisure. Obviously, also, the preliminary to the ensilage question is that of fodder or grass growing; the grass farm, the pasture, and green fodder crops are prerequisites in most parts of the country—*i.e.*, in all places where natural jungles do not exist—to successful ensilage.

85. *Sericulture*, both with the China and the tassar silk worm, has received attention. Several experiments made in different places with the former showed that there was no difficulty in rearing the silk worms in the plains, where food could be obtained, but difficulty arose in preserving eggs from one season to another. More attention has been devoted during the last two years to the economic production of tassar silk, and an officer has recently been appointed to collect and prepare cocoons for winding in the Chingleput district. It is yet too early to forecast any results. As an indigenous and ancient industry and as giving promise of much profit to various classes, whether in the production of silk for the ordinary silk-weaver, or in the gathering of tassar cocoons from the forests for sale to merchants, this branch of industry seems to deserve and to require much attention. Probably, this Committee will not require to consider the matter in detail.

86. *Tobacco-curing.*—The curing of tobacco has recently been taken up under professional superintendence, but operations have only just begun. The suitability of soil and climate to tobacco growth and manufacture, the fact that it has ever been abundantly produced, the immense market open throughout the world, the high prices paid for good tobacco, and the cheapness of its production in Southern India, render this subject one of much importance.

87. *Dairying.*—Experiments in improving dairying were made on the Saidápet Farm, such as the increase of the milksupply, its improvement, methods of making butter, ghee and cheese. The great actual and still greater potential value of the dairy produce of the country—an item often neglected in studying rural economy—deserves very great attention, but is intimately bound up with fodder and breeding questions. No practical result has come of the small experiments on the farm.

88. *Diseases of crops.*—Crop enemies, whether insect plagues or fungoid diseases, have received little attention and hardly anything is known of them critically. To those who have seen fields of dholl or beans apparently flourishing, but with pods riddled with maggots and useless, or a cholum field smitten with rust or smut or eaten of worms, paddy or cumbu crowned with empty ears, tobacco spoilt by parasitical growths, the subject seems one of the highest importance and presenting an absolutely unworked field.

89. *Inducements to improvement.*—The inducements of example, both visible and reported, and of correspondence, were available while the Saidápet Farm was in existence. Under the new organization of 1882, the department became one of mere inquiry and the former facilities were consequently abridged. The remaining inducements are afforded by exhibitions, as examples, as educational institutions and as furnishing prizes, by the distribution of a few stallions, stud bulls, and rams, and by the encouragement of private enterprise. This Department does not work the Land Improvement and Agriculturists Loans Acts.

BENGAL SECRETARIAT LIBRARY.

90. *Exhibitions.*—In 1854 Government resolved to embark on a comprehensive scheme of district exhibitions, from which success was expected "if the effort should be general, generous and long continued." Prizes were to be offered for—

(1) The principal grain and other crops of the district to a sufficient extent to excite the interest of the ordinary ryot in the shows. The grain was to be shown unthreshed.
(2) Cattle, sheep and poultry.
(3) More valuable produce, such as cotton, indigo, sugar, for which the prizes were to be more liberal.
(4) Improved agricultural implements, but only for some real improvement.
(5) Special products, such as oils, fibres, &c., and a small sum was to be allotted for extra prizes.

It was contemplated that Government would exhibit at these shows samples of superior products and specimens or models of improved implements, and the committees of management were to purchase moderate quantities of superior produce of the districts for display at Madras. Shows were held accordingly in 17 districts in 1856, the budget allotment being Rs. 58,000 and expenditure Rs. 31,564. The Board considered the shows to have been highly satisfactory; interest had been excited and suspicions allayed. In 1857 shows were held in 10 districts at a cost of Rs. 20,557, but results were not considered very favorable; hence, for 1858, orders were issued to hold shows only at places where success was probable; in 1858 there were no shows owing to the political state of the country, but in 1859 shows were held in 15 districts at a cost of Rs. 35,486. The Board considered that exhibitions had now had a fair chance and had failed to a considerable extent; in this view Government concurred and discontinued the shows till such time as better success seemed probable; the cattle shows of Nellore were however to be continued; for these cattle shows see paragraph 92 *infra.* In 1864, 1865 and 1866 general exhibitions were again tried but only in Bellary and Tinnevelly. Those in the former were on a new principle, viz., taluk shows at the time of the jamabandi; the result was not satisfactory. In Tinnevelly the exhibitions were not at all successful. In 1867 a successful show was held in Malabar at Calicut, to which the people subscribed Rs. 1,950 for general expenses, the Government grant going wholly as prizes. A similar show, with similar local contributions, was equally successful at Pálghat in the same year. Till 1874 there was no other general show except one at Ootacamund in 1869 and small local ones in 1864 and 1867 in the Salem district. The expenditure on all these was small, averaging about Rs. 1,800 each.

91. The subsequent history of exhibitions is given by Mr. Benson as follows:—

G.O., dated 14th May 1873, No. 485.

"In 1873, Mr. Robertson submitted certain remarks and suggestions regarding exhibitions for the consideration of the Board, in which he alluded to the results of the shows previously held as having been very disappointing, attributing this to—

(1) The country not being ready for the exhibitions.
(2) Too great results being expected.

(3) The shows being on too elaborate a scale and of too refined a nature and being modelled too much on the English plan.

(4) Want of perseverance in the system.

"At the same time he pointed out that shows in this country should resemble very much the American State Fair; their objects should be educational and commercial; and that at them the ryot should be rather interested than surprised and astonished, and should find them marts for the sale and exchange of stock and produce. He advocated migrating shows like those of the R.A.S.E. and the award of trophies for district competition; the reading of papers on agricultural topics at the shows; and the offer of rewards for essays. The Board concurred generally in these views, and especially with those relating to making the shows exchange marts for stock and produce and fairs generally, and the Government called for proposals for an exhibition to be held at Madras in 1874, which was accordingly arranged and held. The show was not such an undoubted success as could have been wished, but was far from being a failure, and the Board recommended that the shows should be repeated, the prize list being revised by the experience gained thereat and at the shows held in Lord Harris' time. In submitting a revised prize list, Mr. Robertson again alluded to the main feature of these shows being their educational quality both to the ryot and to the Government, but the Board in submitting it to Government recommended that the show should be deferred until Mr. Robertson had visited some of the more advanced districts and studied the methods of agriculture practised there. This view was accepted by the Government and for various reasons and especially on account of the famine no further shows were held during the next eight years. In 1882, however, a general scheme for holding two shows annually at different places in the mofussil was submitted to, and approved of, by the Government, and it was decided that the first show on the system should be held at Madras. The places to be selected for the mofussil shows were to be specially chosen for their convenience of access or at places of pilgrimage, &c., and the time for the shows was to be fixed with reference to their coincidence with time of festivals, fairs, &c. The first show was organised and held at Madras in February 1883, and a full report thereon prepared, in reviewing which the Government stated that they considered the show had been on the whole a success."

G.O., dated 13th June 1873, No. 605.

G.O., dated 18th September 1874, No. 1191.

G.O., dated 9th June 1875, No. 899.

G.O., dated 3rd March 1882, No. 257.

G.O., dated 9th September 1882, No. 959.

G.O., dated 17th November 1883, No. 1373.

92. Regarding the Nellore shows, Mr. Benson has written as follows:—

"The Addanki cattle show was established in 1859 and prizes were given at it to the amount of Rs. 665. A summary of history of the show up to that date will be found in a letter from Mr. Dykes, Collector of Nellore, dated 28th January 1869. The show was intended to serve both the Kistna and Nellore districts, and it was found that the cattle brought were generally the finest specimens of the breed, excepting in the case of cows, which it appeared the ryots did not like to exhibit. In 1862, strong efforts were made to overcome this, and the committee, in referring to the progress made in overcoming the scruples of the ryots, remarked that it was 'a fundamental principle with the breeders of stock, that the improvement of cattle depends as much, if not more, on the amount of care bestowed on the rearing of the cows, as of the bulls.' In 1865, His Excellency the Governor, Sir William Denison, attended the show and recorded a minute regarding it, and the Government decided that special encouragement should be given to the rearing and feeding of cows and heifers. The amount of the prize list had been gradually increasing and was Rs. 1,600 in 1866, special prizes being given for cows and heifers with good results.

Board's Proceedings, 11th February 1869, No. 5935.

"In the meanwhile, a show had been established at Nellore also, and the two shows were continued year by year from 1863 to 1869 except in 1868, when the Nellore show was not held; but in 1870 one only was held at Ongole in October for the whole district, the earlier shows having usually been held in January and February. This show was not satisfactory, however, as the place was evidently too remote for the breeders of the Kistna district to appear, and Addanki was reverted to in the succeeding year, and shows were held at that place and at Nellore in January and February 1871, respectively, and were repeated during the years 1872, 1873 and 1874, whilst in 1875 only one show was held at Addanki, the Nellore show having been abandoned. In submitting the reports on the show for the year 1871, the then Collector disparaged the utility of the shows, and expressed a doubt whether any public good had been or was likely to be done by a show of the sort, commensurate with the cost. He remarked that—

G.O., dated 16th March 1865, No. 531.

"'My experience of Indian agriculturists renders me altogether sceptical in regard to the possibility, within any definite period, of forcing them either by precept or example appreciably beyond their customary grooves of action. In breeding and rearing fine cattle with more care than obtains in most other parts of the country, the ryots of the Sub-division are simply continuing

to do what they and their ancestors have always comparatively excelled in. If it could be shown that a greater general degree of excellence either has been, or is likely to be, manifested as the result of the Addanki and Ongole cattle shows, then no argument would be needed in justification of the annual expenditure thereon; but I greatly doubt whether any such result either has been, or is likely to be, produced.'

* * * *

"'So many sanguine expectations have been hitherto indulged in, and so many encomiums have been passed upon these cattle shows, that I do not flatter myself that much weight will now be attached to my remarks. I perform the invidious task of recording them, because the subject involving a considerable expenditure of public money, it is my duty to state the opinion I have formed, and I may add that in this opinion I am authorized to state that Mr. Thacker, the Veterinary Surgeon on special duty, entirely concurs with me.'

* * * *

"'The Nellore agricultural exhibition, putting altogether aside the northern cattle, has, as far as I can judge, never been a real success. That of 1869 was evidently, when judged by present results, but a fictitious success, due entirely to His Excellency the Governor's visit, which again led to the presence of the Rajah of Venkatagiri and other territorial magnates, all of whom naturally, under the circumstances, displayed a great interest in the exhibition. But, except under the provocation of a gubernatorial visit, it is no use attempting to disguise the unmistakeable fact that our district nobility do not care a button for agricultural exhibitions. While congratulating himself on their co-operation in 1869, Mr. Dykes plainly avowed in his report that the co-operation of the large landed proprietors was essential to real success. He said that successful exhibitions could no more be held in this country without their cordial help than they could be in Great Britain, were the nobility and landed proprietors to stand aloof and leave the shows to be supported entirely by the officers of Government and the farmers. In this view I entirely concur with Mr. Dykes, but, like his, my wishes are not father to my thoughts, and I am not sanguine enough to anticipate, I won't say genuine, independent, sustained interest, but any sort of interest on the part of our principal landholders in the Nellore exhibition, except when the same may be patronized by the Governor in person.'

"But the Board declined to accept his arguments or to give up the shows in deference to his adverse judgment upon them, and in this they were supported by the Government, who considered the results attained at the shows to be not nearly as discouraging as Mr. VansAgnew considered them and thought they had exercised a wider influence in improving the breeds than was readily apparent, and directed the continuance of the shows. In those conclusions, the Secretary of State concurred and the shows were continued as noted above till 1875 in which year the opinions of the Superintendent of Government Farms and Veterinary Surgeon Western, then on duty as Inspector of Cattle Diseases, were obtained on the question of their value, and the Government recorded their opinion that the shows were of much importance and had been of much value, remarking, with reference to the results of the Addanki show of that year, that—

G.O., dated 13th May 1871, No. 850.

G.O., dated 24th October 1871, No. 1840.

G.O., dated 24th August 1875, No. 1272.

"'His Excellency the Governor in Council is satisfied from the results of these shows that a spirit of competition has been excited, which, if properly encouraged and directed, must lead eventually to the formation of a few herds of exceptional quality, such as must, in the natural course of events, establish value sufficient to induce the owners to part with individuals belonging to them.'

"'As observed by Messrs. Robertson and Western in paragraph 3 of their report, the presence of even a single improved bull in a village is a cause of satisfaction, as such animals must eventually make their mark on the breeding cattle of the district and improve them.'

"After this, however, no further shows were ever held in the district, owing to financial pressure."

93. A new series of shows was begun in 1887. On the motion in 1881 of the Collector of Tinnevelly, who suggested an exhibition to be started and continued for several years in his own district, the Board eventually proposed, and Government sanctioned, two exhibitions annually, one being at Gooty and the other at Coimbatore, Salem, Cuddalore, &c. Owing to unfavorable seasons none was held till 1887, when Gooty and Erode were selected. In 1888, Bellary and Salem were chosen, as Gooty and Erode were not very suitable, and the same stations are those selected for 1889. The exhibits are of five classes, viz.:—A, live stock; B, vegetable products of all sorts; C, animal products; D, manufactures; E, implements and machines. These were originally sub-divided into numerous minor heads, and these again contained

G.O., No. 257, dated 3rd March 1882.

G.O., No. 146, dated 30th January 1884.

numerous items. Hence the prize list of 1887, of, say Rs. 5,000, contained above 500 prizes from Rs. 2 for a couple of measures of horse-gram to Rs. 50 for a Nellore bull; the amounts for cattle were Rs. 1,800 and for grains Rs. 1,500. Experience has now modified the prize list so that Rs. 4,850 are given in about 260 prizes, of which Rs. 2,770 go to class A and Rs. 670 to class B; prizes vary from Rs. 5 to Rs. 75. Moreover, many of the vegetable products are to be shown in collections, each of not less than five articles; cereals and pulses are to be shown not merely in collections, but in the straw, so as to prevent prize-winning by merely sifted sample.

Year.	Exhibitions.	
	No.	Cost.
		RS.
1874	1	8,890
1883	1	18,045
1887	2	8,755
1888	2	10,546
1889	2	10,095
Total ..	8	56,331

94. It will be observed that when shows were first begun Government laid down as a condition of success that they must be "general, generous and long continued." The history of the shows is one of discontinuous effort, due however to decided want of success in some cases, and to an opinion to which Mr. Robertson gave form in 1873 that the country was not yet ready for exhibitions; political, financial and seasonal difficulties also interfered. Continuity, however, is clearly a necessary condition of success, and it is just a question whether exhibitions ever had a fair chance; three years is not long enough for a trial; in 1884 Mr. Pennington suggested ten years. Obviously it is money thrown away if shows are held irregularly or at long intervals; if they may be, as some believe, instrumental in encouraging the ryot to improve his stock and produce, it can only possibly be by constant and continuous encouragement.

95. It has been suggested that petty prizes for cereals, &c. (class B), are of little use; no ryot, it is said, will alter his practice on the mere and infinitesimally small chance of possibly winning a prize of Rs. 3 or 5. Few ever know of the existence of a show, and fewer will remember the possibility of an approaching show and the conditions of competition; fewer still will involve themselves in the trouble of competing on the chance of a small prize. The mere chance of such a prize cannot give to the ryot that continuous stimulus which shall lead him to study to develop his practice so as to improve his produce: if the knowledge of a good market and better prices which are always available for high class produce will not do this, it is certain that the chance of a petty prize will not do so. The ryot does not know competition in the English sense of the word, *i.e.*, market competition; it is but lately he has begun, if he has generally begun, to farm for the market at all, apart from stock breeding and special crops; he farms generally for his own stomach and for money enough to pay for his clothes, his kists, and his salt. Such are the arguments of one party, and though they have had the effect of reducing the grain prize list, it is a question whether that list is worth retaining. Similar arguments are brought forward against classes C and D.

96. Whether prizes for animals (class A) have a real effect in stimulating the improvement of stock is another moot point. Some deny it, and say that the ryots simply show their best cattle which have been bred not for the show, but for breeding, or for sale of their progeny, and that the stimulus, if any, afforded by the shows is infinitesimal and quite incommensurate with the cost, which could be much better spent than in awarding prizes to or even encouraging a very few super-excellent cattle. Magnificent cattle have been produced in myriads from time immemorial, and shows have *not* begotten such beasts. Nor are the shows of use in giving ryots an opportunity of seeing and profiting by such beasts, for the immemorial cattle fairs of the country show such cattle by tens of thousands at a time, if not as bulls and cows, yet as splendid bullocks which necessarily connote good sires and dams. Neither as educational shows nor as fairs do the expensive yet petty exhibitions serve the purpose which the great country fairs serve without cost or trouble. If, however, it be desired to stimulate breeding or to give prizes to worthy recipients, it would be easier and better to utilize the great cattle fairs. These are the arguments of several officers, and they remain for consideration when discussing the utility of the modern exhibition.

97. On the question of their general utility, shows have been objected to not as absolutely useless, but as not giving or being capable of giving appreciable results, while their cost hinders expenditure in other directions. It is said in favor of shows that they will be very useful "if the ryot learns to take an interest in them;" it is argued on the other hand that this is just what he is not yet capable of taking, *i.e.*, an *intelligent commercial* interest, an interest apart from that of a mere tamasha or "vedikkei." He has not got and will not get by mere casual and petty exhibitions, of which 99 out of 100 have never even heard, that commercial sense which enables him to examine and gauge the markets, to recognize that finer cotton and better indigo produce more net profit than short coarse staples or adulterated indigo; nay, he has strong doubts whether the extra price would pay for the extra cost of cultivation. Exhibitions are only useful when the country has a strong instinct for commercial competition; when the foundation of the shows is a determination to know what other people can do or what they want, to learn the facts or results of other practices and conditions, to ascertain the methods which led to such results, to gauge the conditions of the markets and the best way to meet those markets, to take prizes not merely as a matter of competition, but as an advertisement, as a means of getting known in the markets and establishing a name and a consequent standard of prices which shall bring heavy custom and large profits. In the matter of agricultural shows, it is pointed out that they are fostered chiefly by the great societies and by the numerous local associations and supported by great landholders interested in high rents, by farmers interested in large outturns, by manufacturers and growers who want a market for their implements, machinery, manures, cattle and seeds. Here in South India there is no such commercial instinct; the ryot is ignorant of the general market, and knows only his broker, his weekly fair (if it exists) and his ancestral practices; there are no associations, the basis of real agricultural interest, no manufacturers and salesmen. The country is in the condition of England in the 17th or 18th centuries, and is as incapable of supporting exhibitions as England was then. Moreover, it is asserted that though a ryot may be glad enough to try and cut out his neighbour in his village, he is not yet educated to 19th century ideas of competing with all the world; that is an idea begotten of the commercial instinct. England developed exhibitions to supply a want that was felt; it is unlikely that they will succeed where that want is not felt, and they are not likely to develop that want which is the offspring of conditions as yet practically unknown in South Indian rural life. The ryot likes to be first in his own village; but as the village or immediate neighbourhood is practically his world, he does not yet think of competing outside of it. Hence exhibitions at the head-quarters of a district are of little interest to a ryot of the next taluk; *á fortiori* to those of the outside districts. These and other arguments are adduced by some against exhibitions which are by them regarded as very expensive methods of producing very small results.

98. It has been suggested that as the spirit of *village* competition, *i.e.*, of each man with his immediate neighbour, is pretty vigorous, and as continuous visible example and competition are infinitely greater stimuli than casual exhibitions, and as prize specimens of grain and produce in no way necessarily connote higher agricultural practice, in that they may be merely sifted specimens, or even bought for the occasion, it would be better to adopt a village competitive prize system. It will be remembered that in 1864, it was considered that district head-quarter shows, even though held in each district, did not appeal to the ryots generally, and Mr. Wedderburn and Mr. Thomas and others advocated and held taluk or local shows. These never had much of a trial, as they were only held in one year and under unfavorable conditions. Lately, however, it has been proposed to adopt a system tried with much success in Ireland by the then Lord Lieutenant. This was to select certain areas, usually those near a school where agriculture was taught, and to give a series of moderate prizes for such peasant farms of not more than about 5 acres, as showed the greatest improvements and best management. Judges were appointed who visited the farms and gave marks for each item of farm management, the winners then getting a small money prize. The plan met with great success, and Professor Baldwin, who for five years was one of the judges and reporters, was enthusiastic in its praise. The plan died out after about five years not from want of intrinsic merit, but for want of public spirit, for want of treasury support to make it universal, and by reason of difficulties connected

with the law or customs of landlord and tenant. The success was manifestly not *dependent* upon the amount of the prizes, which were small, each not more than Rs. 30, but upon the aroused spirit of local competition and emulation, of pride and devotion to the soil, upon a developed taste for improvements, upon a quickened perception of the viciousness or error of many old ways and of the merits of new modes and ideas, upon the recognition that labor is frequently synonymous with capital, and that neatness, order and care in the conservation of waste meant greater returns in produce.

The increased mental activity fostered by the scheme is shown by the eagerness with which peasant farmers, too old and too ignorant to go to school, sent their children to the school and catechised them on their return as to the ideas they had learnt there.

Professor Baldwin was of opinion that by the improvements shown to be available under the influence of this system, the incomes of the small farmers might be doubled, and that the capital required is available in the labor of the farmers themselves. Here, in South India, the objections peculiar to Ireland are absent; the ryot is shrewd and painstaking; his land is practically his own, and he has no fear of raised rents at least for 30 years, and even then his rent will only be raised upon general considerations and with reference to the "unearned increment" caused by general progress and the rise of prices.

What is wanted is the organization, both of the scheme and of district societies to carry it on, and of grants of money to support it. Moreover, prizes need not be merely pecuniary; Mr. Wilson, as Director, has suggested for exhibitions the grant of prizes in kind, *e.g.*, to the owner of a prize heifer, a young stud bull; to the owner of prize bullocks, an improved plough or set of farm implements and so forth. This might be well applied to the prize-farm system, winners getting prizes of cattle, implements, &c., according to circumstances. Add the chance of honorary rewards whether tangible as bangles of gold or silver, which might form heirlooms, or insignia, such as titles which should carry local weight and ensure "mariyâthei" at village festivals, and the system might be very successful as consonant with indigenous ideas. But it is true that local associations will be necessary conditions in working out the system.

99. "In addition to these shows promoted entirely by Government agency, the department has afforded assistance and money in some cases to shows promoted by private enterprise at—

Chittoor in 1884.
Madura in 1885.
Rajahmundry in 1885.

G.O., dated 10th May 1884, No. 624.
" " 12th December 1884, No. 1379.
" " 21st April 1885, No. 450.
" " 11th December 1885, No. 1368.

"The show at Chittoor was promoted by an agricultural society formed there under the patronage of the Collector, which also started a small farm. The society and farm, however, both disappeared in 1885.

"The show at Rajahmundry was promoted by private enterprise and a grant-in-aid of the objects of the show was made by Government.

"The show at Madura was organised by the Local Farmers' Club and received a grant-in-aid from Government, but though it was intended to continue the grant, no further shows have been held there."

100. *Encouragement of private enterprise.*—Mr. Benson has abstracted operations as follows:—

"In their orders of December 1881, the Government of India pointed out the necessity for agricultural departments working through the agency of native agriculturists. In this Presidency, the only work done in this direction that can be alluded to are the following. A wealthy mirasidar of Shiyáli in the Tanjore district having for several years persistently devoted his time and energies to the introduction of improvements on his estate, the Government in 1885 resolved to award him a gold medal as a mark of their appreciation of his enterprise, and on subsequent occasions recorded their pleasure and approval of his efforts. Unfortunately that gentleman has since died. A merchant of Bellary, who takes a great interest in the cotton trade, took a large block of land in hand in that district and his operations were the matter for a special report in 1883, but it is not known whether he continues his experiments. In 1884, the Rev. H. Little, of Karúr, applied to the department for assistance in founding an agricultural colony on some land he had acquired

G.O., dated 19th June 1883, No. 748.

near Karúr, with a view to making it a centre for the dissemination of new ideas. It was not possible for Government to grant all the requests made, and rather than accept those offered on the conditions laid down they were rejected. The department only gave some assistance in the way of stock and implements.

"In the same year, the Collector of Madura applied for help towards a farm then recently started at Madura by a committee of native gentlemen, and the Government sanctioned the grant of the salary for a superintendent for 3 years on condition that the Director could give a satisfactory report on the farm at the end of each year, and also the grant of some stock. This farm is still in existence, but the future policy to be pursued regarding it is under discussion and the consideration of Government.

G.O., dated 17th April 1888, No. 2269.

"The ephemeral existence of the farm started at Chittoor has been noted. An Agri-Horticultural Society formed at Narsápur a few years ago obtained the promise of a grant of land on certain conditions, but nothing is known of it at present. And at Tinnevelly, an agricultural association exists which has been manufacturing ploughs for sale to the ryots and attempting the introduction of seeds of new or improved varieties of plants. The means of the society are believed to be small and its existence precarious.

"The Madras Agri-Horticultural Society, founded in 1835, has always received some aid from Government in return for assistance in promoting agricultural improvement. In 1854, the Government, in reviewing what the society had done, noticed it unfavorably. In 1869 the society put forth a statement of what had been effected by it during its existence. At that time it received a grant of Rs. 3,000 from the Government, as well as a special grant annually to enable them to make their annual show somewhat agricultural. In 1873 the Government of India inquired into the working of the society, and, after pointing out that the usual grants were intended specially to encourage operations towards the advancement of agriculture and horticulture amongst the native population, sanctioned the continuance of the grants. The work of the society was reviewed again in 1879 and in 1883, and after the date last named the annual grant was raised to Rs. 4,000, and the close co-operation of the newly-formed Agricultural Department with the society was urged. The grant is not made from funds allotted to the department and the co-operation of the department and the society is very limited."

G.O., dated 21st December 1869, No. 3223.

G.O., dated 12th January 1874, No. 43.

G.O., dated 26th September 1883, No. 1194.

The development of private enterprise is a subject which would well repay attention, whether it took the form of encouraging local associations or private individuals. It is indeed matter for consideration whether the chief efforts of the Agricultural Department should not be devoted to the stimulation of enterprise and self-help, not merely because the result of efforts by the mass of farmers must be far greater than that of any Government effort, but because of the result in the strengthening of public self-reliance and in a *pro tanto* diminution of the leaning on Government.

101. *Staff.*—The present staff of the department is as follows :—

(*a*) The Assistant Director, who is for all practical purposes a Joint Secretary to the Commissioner in the Department of Land Records and Agriculture, has besides the work which falls to him in that position—
- (1) charge of all Famine Analysis work;
- (2) charge of the Stock Depôt;
- (3) supervision of travelling shows;
- (4) to assist as special adviser to the Collectors at mofussil shows;
- (5) to act as referee on all matters agricultural;
- (6) to perform any agricultural work in the department which may be necessary from time to time, as the Director orders.

(*b*) The Inspector of Cattle Diseases—
- (1) is the veterinary adviser of the Director;
- (2) has to supervise and direct the work of the Stock Inspectors; and
- (3) to train probationers for their posts.

(*c*) The Deputy Inspector of Cattle Diseases—
- (1) is in charge of pony-breeding operations under the orders of the Collectors of Salem, Coimbatore and Nílgiris;
- (2) occasionally assists in work connected with the Stock Depôt, Hosúr.

(*d*) The Sub-Assistant Director of Agriculture is practically an Assistant to the Inspector of Cattle Diseases, but is available for agricultural work on special occasions.

(*e*) The Agricultural Inspectors (7) are employed almost solely in connection with the preparation of Famine Analysis, but may be deputed to such work as—

(1) charge of travelling shows;

(2) supervision of special experiments with seeds, such as the barley experiments on Nílgiris;

(3) to assist at mofussil exhibitions.

(*f*) Stock Inspectors—

Nominal strength		23
Actual	Inspectors	17
	Probationers	5

These are allotted one to each district for cattle disease prevention work, under the orders and control of the Collectors. They are also held responsible for looking after any stud bulls, &c., sent out by the department, and it is intended to utilize them, if possible, in pony-breeding and castrating operations.

In 1887, it was proposed to combine the functions of the superior officers of both branches so as to allow of better results being obtained with the small staff which it is at present possible to employ, but no change was made and the staff stands as noted above.

G.O., dated 10th January 1888, No. 14.

It will be remembered that there is no longer a Government Farm, and that the Principal and Assistants of the Agricultural College, Saidápet, belong to the Educational Department.

102. The above small staff is all that is available for every branch of agricultural work. Putting aside the staff employed in stock breeding and in operations against disease, there are but one superior officer and seven Agricultural Inspectors for all classes of agricultural inquiry and improvement. It will be remembered that the Government of India desired that searching and systematic inquiry should be the primary duty of the department, and though the programme laid down did not expressly include an examination of agricultural details and of the principles underlying, or reasons assignable, for native practices, yet the inquiry could hardly be complete without such examination, which, consequently, was probably intended. No such systematic inquiry has yet been made; the most that has been done is that either Mr. Robertson or Mr. Benson has made a somewhat hasty tour, perhaps only of a few weeks, perhaps not in the cultivation season at all, in which brief time they were supposed to gain enough knowledge of a district to report on it. The press of other duties, whether of the college or of the department, prevented further time or a better season being made use of. It has not been possible or permissible that either officer should spend the best part of the year for years together in a microscopical examination either of a district or group of districts, of a subject or group of subjects. Yet it is surely only when everything is known on a particular practice or crop or district, that it will be possible to begin, if necessary, to correct or modify such practice. Professor Wallace seems to be right in this at least, that the agricultural officers he proposes should, after three years of general work in learning customs and practices, devote two-thirds to three-fourths of their subsequent service in the districts, taking daily notes. The agricultural officers he proposes are men trained in practical agriculture from their early youth who have subsequently acquired a sound knowledge of the sciences bearing on the subject. The only officer now available is one (Mr. Benson) who not only fulfils this condition, but has had 15 years' training in this country, having had much experience on the Farm and in tours of observation, experiment and demonstration; this experience must have taught him to give full weight to the empirical knowledge and hereditary skill of the ryots, as gained under and suitable to past economic conditions, while it will also have enabled him to detect the weak points in that practice and to suggest modifications of it to suit existing conditions. This being so, it would seem that his primary duties should be those of tours for microscopical scrutiny and observation; not tours of general observation, but tours intended to examine particular subjects.

103. To take an actual case: the clean cotton outturn of Tinnevelly is said to be about 62 pounds per acre of first class black cotton-soil, a similar yield being stated for the black soils of Coimbatore and the Ceded Districts; the kistbandi was most unsuitable and the price obtained by the ryot much less than the market price warranted. Now a critical study by Mr. Benson on the spot from September to March would have ascertained these defects and probably their reasons; a critical examination of the soil and subsoil, of all the operations of cultivation, including ploughing, manure and manuring, sowing, &c., of the seed sown, of the growing plant and its life-history, of the bolls with their enemies, would have disclosed the probable reasons of outturn poor in quantity and quality; such inquiry could not fail to have shown that a kistbandi demanded from December to May, three-quarters being payable by the 15th March, must be wrong when the crop is sown in October-November and picked only in March to May, and that in fact the kists were actually paid by the broker whose terms of advance were said to be Rs. 10 to 12 per pothi of cotton deliverable on, say, 15th May, the real market price being then Rs. 16 or 16½, besides penalties for non-delivery on due date. This kistbandi has now been altered to one beginning in February, to the great relief of the ryot. Similarly the inquiry could not fail to have suggested ways of minimizing the middlemen. No such inquiry has yet been made, the old cotton experiments having been attempts to introduce American cotton and American modes. Cotton is only an instance; a critical study, by the one expert available, of cereals, and their soils and local conditions, could not but lead to disclosures of unknown facts, unknown partly because not inquired into, partly because no trained mind has examined them. This is presumably the inquiry recommended by the Government of India; that inquiry is admittedly not a mere statistical inquiry, but an inquiry by observation; and it is obvious that while engaged for, say, six months, on this special inquiry, he would have large opportunities of learning many other matters of practice and of inculcating new ideas and demonstrating new modes of work; above all, of organizing local effort towards self-development in agriculture. At present, however, Mr. Benson seems by the programme in paragraph 101 to be a general-duty officer, whose numerous duties leave no continuous chance of such inquiry, and whose chief work is that of carrying out the famine analysis; this, at present, consists chiefly in collating mere village statistics, a work which does not demand of an expert anything but the examination of results from an expert's point of view; the mere collation can be done by any intelligent officer; there seems therefore much waste of power and time in using for routine work the sole officer who has special knowledge and powers, leaving special inquiry work undone. In the arrangement of the duties of the department, it would seem advisable to give Mr. Benson work which should make full use of his special qualifications.

104. The Agricultural Inspectors are few in number; their qualifications have been hinted at above, as where Mr. Benson (*passim*) complains of their want of practical training and of their inability to conduct experiments as in diversified cropping or ploughing demonstrations, without close supervision. That is their misfortune, not their fault; originally of a class or status which ordinarily does not personally conduct agricultural operations, their training before entering the college was probably devoid of technical work, their training at college was more theoretical and bookish than practical, and the subsequent farm training in most cases was *nil*. It is a received axiom that a practical, daily-learnt knowledge of farm work before going to a college and at least 3 years' practical farm work afterwards on a properly conducted farm, is necessary to make a man a scientific and successful *farmer* as distinguished from a mere lecturer. As Mr. Benson has pointed out there are in this country no well-trained farmers to whom the Agricultural College graduates could go for their practical course after passing out of the college, and in the absence of such farms, Government must provide the means if the men are to become farmers at all and not mere bookmen, unfit even to conduct "agricultural teaching without they were under a considerable amount of supervision from European officers" (Benson 1879). The practical training is now even less than before, since the Saidápet farm has been abolished and the educational farm is an educational annex to the college and nothing more.

105. The following is a statement of charges of Government Farms, Cattle-Disease Inspection, &c., from the year 1865 :—

Years.	Supervision from 1871. Mr. Robertson's pay and office establishment.	Saidápet experimental farm.	Model farm.	Estate improvement.	Education.	Implement workshops.	District operations, including seed distribution, &c.	Cattle-disease prevention.	Stock-breeding.	Pony-breeding.	District analyses.	Exhibitions.	Total.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1865-66	..	8,691	..	3,831	..	..	..	..	..	..	..	..	12,522
1866-67	..	10,587	..	3,680	..	..	..	..	..	..	..	..	14,267
1867-68	..	11,928	..	5,288	..	..	..	..	..	..	..	..	17,216
1868-69	..	16,322	..	2,473	..	..	..	..	..	..	..	..	18,795
1869-70	..	14,966	..	3,172	..	..	497	..	..	..	..	..	18,635
1870-71	..	18,058	4,218	6,232	..	1,991	244	..	..	..	..	..	30,743
1871-72	6,815	9,832	4,147	7,766	..	3,400	630	..	..	..	..	..	32,590
1872-73	11,307	7,214	4,658	4,334	4,963	2,769	..	..	..	..	..	..	35,245
1873-74	10,296	7,730	3,873	6,178	4,400	2,149	..	..	..	..	..	8,890	43,516
1874-75	18,191	8,156	5,057	4,856	3,010	2,121	..	..	..	..	..	..	41,391
1875-76	18,672	12,503	4,206	9,928	2,355	2,359	..	6,698	..	..	..	..	56,721
1876-77	20,485	12,874	..	6,374	6,951	1,947	1,189	..	..	..	..	..	49,820
1877-78	19,614	10,803	..	10,356	19,916	2,031	192	..	..	..	..	..	62,912
1878-79	21,442	12,082	..	4,743	23,389	1,730	376	..	..	..	..	..	63,762
1879-80	14,947	9,580	..	3,499	28,798	939	1,341	..	..	..	..	..	59,104
1880-81	16,839	7,418	..	3,531	15,401	..	576	..	..	..	..	..	43,765
1881-82	21,269	9,749	..	2,811	20,325	..	648	..	..	..	..	..	54,802
1882-83	23,264	10,238	..	2,487	24,843	..	7,803	8,809	..	..	..	18,045	95,489
1883-84	25,050	11,308	..	2,035	23,852	..	4,669	23,103	2,207	..	..	..	92,224
1884-85	15,374	7,483	..	1,283	39,242	..	2,644	28,008	..	..	..	..	94,034
1885-86	13,399	4,918	..	77	42,139	..	4,989	33,623	..	692	..	..	99,837
1886-87	14,385	1,704	..	..	44,833	..	7,023	39,418	787	5,261	5,354	8,755	1,27,520
1887-88	15,158	..	..	..	38,547	..	5,153	29,447	4,900	5,774	5,581	10,546	1,15,106
Total ..	2,86,507	2,24,144	26,159	94,934	3,42,964	21,436	37,974	1,69,106	7,894	11,727	10,935	46,236	12,80,016

106. *Recapitulation.*—Before proceeding to discuss item 8 of the Government Order, which involve such questions as agricultural education, including the status and future of the college, experimental farms or agricultural stations, the organization of the department, agricultural societies or boards, the question of capital and Government advances, &c., it may be well to recapitulate briefly what has been done, and the causes of failure. The original idea of 1865 was that the ryot wanted complete teaching; his practices and implements were all to be altered; a farm, originally model, was started to teach him his business; example gave way to experiment; experimental farms required superintendents, and superintendents required education; experiment gradually gave first place to education; education turned out bookmen for whom no farms were ready, nor were they ready for farms: experiment was subsequently entirely abandoned in favor of inquiry; inquiry has largely dwindled to the collection of statistics; positive improvement barely exists; the only considerable operations are those against cattle disease; even this latter organization is described by Dr. Shaw as insufficient and inefficient and a disgrace to a civilized country. There has been no planned-out design, no foundation of inquiry, no continuity of structure; the organism of 1865, conceived in error, born by chance, bred by accident, developed in starvation, guided by change, never had any vigorous vitality. There was in fact no real department till 1882: the Saidápet farm was in some ways a department, but it lacked the necessary machinery and organization; it was isolated and wanting in almost all means of access to and by the people; only by occasional correspondence and by casual visits from the public, and by its reports, could it have any outside influence, in the way of disseminating through precept and practice, the information it had gained, or of suggesting and inculcating new ideas. The department was, moreover, wholly under-manned; its three experts—Messrs. Robertson, Benson, and, for a time, Schiffmayer—were chiefly occupied with farm and college duties, and could not work continuously and closely at the numerous investigations suggested or thrust upon them from time to time, and which required the organized staff of a department. After the change in 1882, the staff was practically confined to one officer (Mr. Benson) since Mr. Schiffmayer had retired, and Mr. Robertson was entirely occupied with college work. Even the graduates trained for agricultural work at the college were in the end not of much use, for they were not of the ryot class; they had no definite and assigned future; they had no farms on which to demonstrate what they had learnt; and had there been farms, they, as for the most part theoretically trained, could not have worked them. There was no organization reaching from the Government through the Board and the Director to the districts and villages; there was not, and is not to this day, any attempt to carry out what in the opinion of the Government of India should be "the earliest ambition of the Agricultural Department," viz., "to secure the active aid of those members of the native community who are sincerely interested in agriculture." There has been no effort to organize associations in every district in touch with the central bureau and ramifying into every important village, so as to provide the means of obtaining and disseminating information, and of carrying out well-chosen experiments usefully and successfully; experiments otherwise than on the farm were casual and fitful; they were seldom carried out in ultimate fact by experienced hands or interested brains; they were not properly supervised; they were conducted in an amateur half-hearted way; the experiments whether with seeds or implements were often ill-chosen and doomed to failure either from want of intrinsic suitability or from want of knowledge of indigenous practices and conditions, which rendered unsuitable experiments otherwise well chosen; they were too occasional and seldom repeated; frequent failure caused indifference and suspicion. These were all faults of ignorance either in the

AGRICULTURAL DEPARTMENT.

Period.	Gross cost.	Receipts.	Net cost.
	RS.	RS.	RS.
1865—82	6,55,806	1,00,432	5,55,374
1883—88	6,24,210	36,362	5,87,848
Total ..	12,80,016	1,36,794	11,43,222

Papers in G.O., dated 29th March 1882, Nos. 350, 351, Revenue.

suggesters of the experiments or in the experimenters; they would not have occurred had there been a department of wide knowledge and full experience of native and especially local practice and conditions properly organized to devise and carry out well-chosen experiments, either direct or by suitable experimenters. The great fault was not that there was incessant change, but that there was no decided plan of operations, so that change was a necessity; that there was no organized department to carry out such a plan and hence that there was discontinuity and feebleness of purpose.

107. If this be the lesson of the past, it would follow that success in the future demands a proper plan and a proper organization to carry it out. This is the work provided for the Committee under question 8. The points for consideration seem to be (1) inquiry including experiment; (2) organization including the controlling authority, the paid staff, central and district associations; (3) agricultural education of all kinds; (4) positive improvements.

108. *Inquiry.*—In paragraph 103 *supra*, suggestions have been made as to the mode of agricultural inquiry which would properly utilize the solitary agricultural expert of the department; the present methods of inquiry have also been indicated in paragraph 35.

The weakness of the Agricultural Inspectors has also been noted in paragraph 104 and will be further dealt with below (paragraph 172). It is obvious that the inquiry must ascertain every detail of the art (*a*) as known, (*b*) as generally practised, with (*c*) all the reasons for such practice including those which have caused departures from or failure to work up principles known either to the ryot or to Western agriculturists. Such inquiries must be conducted by men trained both in the science and in the actual practice of farming and by no others; it is only they who know the questions to be asked, who can actually put them, who can understand the answers, and who can suggest any necessary modifications as a result of the answers.

109. *Experiment and demonstration.*—But, as elsewhere remarked, is not experiment a necessary part of inquiry, especially in this Presidency, where statistical inquiry is not far short of sufficient at least in the information available though not yet collated, and where experiment, inquiry and observation have already accumulated many facts and suggested new departures based either on success or failure? This much is admitted by the Government of India even for less forward presidencies; "at least one Government experimental farm in each province" was the Imperial suggestion, with a recognition that the Madras Experimental Farm had already done much good work, worthy in part of a department, but had been stunted by want of funds. Similarly the Statistical Conference in 1883, which included the Directors of all Provincial Agricultural Departments, formulated resolutions as follows:—

(1) That there should be experimental areas in every province for obtaining scientifically accurate results; every experiment should be on the comparative system, all conditions except those affected by the novelty under experiment being kept identical with those of simultaneous experiments under strictly native conditions.

(2) That such farms should be purely experimental, and that no part of their area should be required to show net profit.

(3) That when an experiment has proved successful, its subsequent demonstration should be effected through the cultivators themselves and not by a model farm (the method by which the cultivators were to be induced to demonstrate is not stated).

(4) That the areas should be small and carefully chosen.

(5) That all experiments should be tried under the varying conditions of soil, climate, &c., hence a necessity for a Central Provincial Farm with numerous out-stations.

(6) That the Superintendents must be *really* competent, if experiments are not to be positively harmful.

Similarly, Mr. Wilson, as Director in 1883, was of opinion that farms for example and experiment were the chief means by which agricultural methods can, if at all, be improved and that no students should be admitted to Saidápet who had

Papers in G.O., No. 610, dated 17th September 1883, Educational.

not been attached for practical training in agriculture to such a school for two years. The earlier paragraphs of this Note show the opinions of Messrs. Robertson and Benson as to the absolute necessity for district farms or agricultural stations whether for experiment, education or demonstration; experiment is in fact a method and a principal method of inquiry, the evidence in which must be largely hearsay outside of experimental demonstration.

110. The past history shows that the methods of experiment are insufficient: private persons and officials have been called on to experiment, of whom the former are largely uninterested in and careless of such experiments, and the latter too busy and too inexperienced in the agricultural art. Moreover, the aid given by the department has been insufficient; it was aided experiment that was contemplated by the Government of India, which is not merely or chiefly pecuniary aid, but that of supervision, assistance in recording and reporting results, inducements by way of honors and rewards, &c. If aided private agency is to be adopted, it must be under proper and skilled supervision and in connection with district organizations for the support and encouragement of the experimenters. But it is also suggested that many experiments cannot be so carried out for generations to come; they require a series of years, with strict comparisons, a rigid observation and control of conditions, a knowledge which gives the power of eliminating accidental or immaterial results or facts, leisure to record and ability to report details and results, skill to vary conditions from year to year so as to test the answers given; *e.g.*, experiments in diversified cropping (paragraph 82); the use of water (81); the comparative crop-result, over a series of years, of new or altered implements, deep tillage and of changes of seeds (37 and 53); the growth of fodder crops (66); ensilage (84); dairying (87); sericulture (25 and 85); arboriculture (25); the results of special manures, or manures manufactured or applied in new fashions (37); the effect of the selection and pedigreeing of seed (47); the cropping of unmanured soils to ascertain whether the soils of a locality are really exhausted to their minimum productive power (normal limit); experiments with stock, &c. &c. It is surely not to be expected that ryots, notorious for conservatism and ignorance of other than ancestral methods, will carry out experiments of admittedly vital importance such as the above and many others, with the intelligence and skill which will render them of any value. It is impossible, at present, even should associations be formed, to find "the thinking husbandman" who will undertake intelligently a difficult experiment and "report it faithfully:" supply good seed known to be suitable to a locality, and only differing from the ordinary crop in being of a better class, add the close supervision of a well-trained man with absolutely no other work, and the results may in so simple a matter be successful for a while, as in the case of barley on the Nílgiris, but are the experiments above named of so simple a class? They are as difficult as they are important, and while their object is utterly incomprehensible by the ordinary ryot, it is unlikely that he will give active aid in trying them. Hence, it is argued that experimental farms are a necessity. This is admitted by the Government of India, who expressly desire the existence of "at least one experimental farm in a province," and who, in 1879, admitted the valuable results of Saidápet in trying experiments and awakening thought.

111. But, as shown above (*e.g.*, para. 81), every district or agricultural tract differs in conditions, and a farm in one corner of the Presidency is of little avail; a central farm, with district and even taluk experimental and demonstrational farms or stations, was once an approved idea (paragraphs 8, 9, 17 and 28). There is not a country in the world, even of the most advanced agricultural character, that can do without its agricultural stations for experiment, &c.; much less can this country, depending almost solely on agriculture, occupied almost solely by petty peasant proprietors, or by holders of little superior status, enterprize or knowledge; a country of serious conservatism, great agricultural and climatic difficulties, rapidly altering economic conditions and a trade which is annually sending away millions of tons of the best constituents of its soils without the smallest returns in manure; a country where the peasants are suspicious of inquiry, inaccurate, careless or misleading in their statements; a country where those who see the need for speedy progress are strangers in experience and in the practice of oriental agriculture, and to whom therefore experi-

ment is a vital necessity as a means of arriving at absolute certitude. Taking the one question of implements; it is argued that the knowledge of improved implements has been sufficiently spread to allow the ryots to take up the matter without Government interference; it is replied that improvement is not yet *demonstrated* to the ryot, for though much may seem to have been done, it is because the facts of 25 years are observed in one view; that a few hundred ploughs, not all used, and the *success* of which is still inconclusive, distributed during a series of years among 30 millions of people, is nothing; that, even if South India were England, it would be nothing; much less is it of avail in South India, a land of conservatism and poor peasants. Hence experiment to prove success is still necessary; equally necessary in this and in the other matters is local demonstration. It may even be suggested that though quicker work can be done with an English mould-board plough, it is not yet conclusively proved that this class of plough is the kind suited for South India, whether it be to replace the "pedda madaka" in breaking up the surface and sub-soil, or the ordinary native grubber in general use for open and light soils, or for wet cultivation. But there can be no doubt that the native ploughs can be much improved; it is certain that the draught of the native plough is so great, and the work done by it per ploughing mile or hour so small, that a really improved substitute would be an incalculable boon. The plough is the centre and necessary beginning of all agricultural improvement; a plough of greater rapidity in action—*e.g.*, one that does in one quick operation what the native plough requires two or three to perform—would enable ryots to take far greater advantage of showers of rain and permit of sowing immense breadths in good time, which are now sown too late after a fall; a rapidly-acting plough would also give greater chance of a second and deeper cultivation before sowing, or would itself till more deeply at the first operation; this would give the proved prophylactic effects of deep tillage. The inestimable advantages thus obtainable are worth a great expenditure in time, energy and money, and should not be left to the interest supposed to have been awakened in the ryot by an occasional implement show; how many people will see, how many will think over, how many will be inclined to act upon, how many *will* act upon the interest, aroused by an hour's exhibition of a plough? What is wanted is a permanent exhibition of ploughs, such as would be the case at an experimental farm where ryots would daily see and be able to borrow or buy such ploughs; in the words of the Board of 1884, "if a dozen experimental farms had been started on sound principles 10 years ago as they might well have been, the Board have little doubt that instead of one Venkata Reddy's using a Swedish plough being considered a phenomenon, the use of mould-board ploughs would have been very common by this time." Similarly the difficulties in the distribution and trial of seeds are detailed in para. 45 *supra*.

Board's Proceedings, No. 2881, dated 18th August 1884.

112. For the above and other reasons, it is then suggested (1) that experiments, whether in methods, implements, manures, seeds, irrigation or rural manufactures, such as silk, tobacco, &c., are needed in *each* district, seeing that soil, climate and conditions are very varied; (2) that experiments proved to demonstration on a central farm must be repeated in the districts (*a*) to ascertain whether they hold good for all conditions, (*b*) for demonstration to the ryots; (3) that experiments cannot be undertaken usefully by any except men with skill, leisure and above all experience; (4) that they must be continuous and repeated both for test and for demonstration; (5) that neither skill nor interest, nor leisure nor continuity, nor intelligent report are possible when the experimenters are amateurs or indifferent; (6) that implements of proved success must be continuously exhibited and be always on show; (7) that the crop results of improved implements must be demonstrated by the comparative method and that this can only be done in visible field demonstrations extending over a series of seasons; (8) that there must be a depôt where such implements can be obtained for experiment and probably for purchase; (9) that the method of repairing improved implements should be continually on view, so that local smiths can come and be taught; (10) that there must be a seed farm or depôt where seeds can be selected, grown and sold and experiments made in pedigreeing; (11) that a depôt is needed for the exhibition of new manures, the best preparation and methods of using new or

old manures, and a place for their sale, or advance in lieu of takkâvi in money; (12) that there should be a central station for stud animals; (13) that for other purposes of stock, such as castration, treatment of sickness, the training of ryot cow-doctors, and demonstration of methods of segregation, a station is required; (14) that a farm is needed for the previous training in practical farming of young men intended for Saidápet; (15) that, for their *subsequent* training, a farm, where they can, under due supervision, work out their theoretical knowledge, is an absolute necessity; (16) that for the training of *apprentices*, viz., lads of the ryot class, as on an ordinary farm but on improved methods, such a farm, after the fashion of the "*ferme-école*" or *école-pratique* of France, is a desideratum; (17) that school-classes of agriculture require a place for field demonstration; (18) that agricultural associations will require a rallying place on which to centre their efforts; (19) that to help the prize farm system, there should be a small six-acre farm, to display, as at Glasnevin, high class farm management yet consistent with small capital. The central and district farm scheme is therefore suggested as a necessity for a really practical department.

113. It is not at all necessary that such farms should be areas bought, stocked and worked by Government: on the contrary, it has been already suggested that areas should be simply hired from several adjacent ryots who should continue to work on them, but under the general supervision of a thorough expert, who would look after say half a dozen such farms, the immediate supervision of each farm being that of a Saidápet graduate. The duties of the superintendents for some time would be those of observation and suggestion rather than of actual control; their duties would be to watch every action and process of the native husbandry; to register *daily everything* that is done, its method and its reason; the preparation of the land, the manure used, the seed, the processes, the climatic and soil conditions; the stock, implements, and the whole farming economy of the ryots down to the sale of the produce and including any money dealing transactions; to ascertain the reason assigned by the ryots for their several actions; to compare the work of the several adjacent holders, and generally to make themselves minutely acquainted with the practices, principles, reasons and resources of the ryots. The stimuli of suggestions, competition, rewards and prizes, exhibition of new implements and seeds, &c., would gradually be added. In this way, without any serious expense or risk to Government, and without the chances of discreditable failure, the superintendents would get a knowledge of district agriculture possible neither by inquiry nor by general observation; they would become trained in practical agriculture; they would be able to allow for the ryot's difficulties and learn respect for his practices and experience, instead of merely quoting from their text-books to try and controvert his actions, and they would gain an insensible influence over the ryots immediately in contact with them, which would enable them gradually to introduce well-considered improvements and eventually to work a demonstration farm or agricultural station. For normal schools and school farms, it would probably be necessary to own and work the lands direct, but it might be possible for the above plan to be adopted in this case also.

114. Mr. Benson rightly objects to "model farms," that is, to starting such a farm to prove forthwith that European methods and implements are better and commercially more successful than Indian methods, but the objection is based upon the present lack of full information as to the ryots' practices and therefore much probable failure on a model farm and an inability to point out a better way to the ryots; if he were sure of his ground, he would probably not object even to model or example farms. But the experimental farms or agricultural stations alluded to above are not model or example farms; they are primarily instruments of inquiry which may gradually be used as a means of demonstration. Mr. Benson, however, himself suggested the possibility of taking up small areas, working them at first under native methods and gradually proceeding upwards by an evolutionary development to real model farming. This was similarly suggested in 1883 when it was proposed to start a farm at a mofussil station; it was then proposed to take up a certain area and work it through the original holders of that area under the immediate superintendence of a Saidápet graduate of some experience, who would thus gradually get a complete knowledge of native practices and a good practical training, when he would be in a position, under competent advice, to gradually work out a proper

development from strictly native conditions. In 1871, the Government of India, under Lord Mayo, proposed a Government farm in every district to be cultivated "*at first* in the most approved native fashion, and year by year on improved and ever-improving systems, and from seeds year by year improved by selection and where necessary by interchange with other farms; where cattle, sheep and poultry breeding should be cautiously but perseveringly carried on;" in fact the process was that of evolution and not of revolution; starting from the same conditions, results were to be produced by means within the ryot's reach and intelligible to his understanding.

115. It may be useful to notice a model farm at Glasnevin, Dublin: the Government farm comprises a large, a medium-sized, and a small one of 6 acres, all worked absolutely separately. The 6-acre farm is intended as a model for peasant proprietors or small tenants: no horse is kept, but the whole is worked by spade labor and the superintendent considers that a man with strong wife and two children could well cultivate it. It is worked on the four-course system, viz., (1) mangel or beets, *well-manured*; (2) oats with grass-seed intermixed; (3) meadow and pasture, the grass being cut for hay and then grazed; (4) oats only, or in the order of 4, 1, 2, 3. All manure is made on the box-system, but this is considered better for working than for milch cattle. Three or four cows can be kept on this area, some food being purchased. The gross receipts are unduly high since the farm is close to Dublin, and milk and butter sell at high prices; on the other hand rent is charged at £4 per acre and all labor is hired, and some cattle food and manure are purchased. The net profit, however, is sufficient to keep a family decently. The above facts were stated in 1887 by the superintendent, an officer of very many years' standing. See also balance sheet in Appendix to Report of Departmental Commission on Agricultural School (1888).

116. *Organization of the department.*—The present staff has been mentioned in paragraph 101. Proposals for the future depend upon the views of the Committee as to the duties and scope of the department, consideration being had to financial possibilities. On this point, Mr. Benson has written as follows:—

See papers read in G.O., dated 10th January 1888, No. 14.

"I have on previous occasions indicated my opinions as to the advisability of reorganization. I think the two existing branches of the department should at any rate be amalgamated and the work distributed, among such staff as can be provided, more generally, so as to allow of better results being obtained. The Presidency should be sub-divided into divisions, each placed under a trained officer of the department, who would have charge of all the agricultural work to be done in it. At any rate, the responsibilities and duties of the technical and executive officers should be separated from any work more purely connected with the administration of the department, at least as long as it forms part of the Board of Revenue. Here I may add that by a proper organization of the existing staff of officers now engaged in work connected more or less directly with agricultural improvement, the Government have the means of constituting a really powerful department and which, if well supported by funds, might well become a power for good. The staff consists of two agricultural officers, one Chemist, who has also passed through an agricultural training, one Botanist, one Veterinary Surgeon. Working together as harmonious parts of one organization, these officers could obtain far better results than can ever be hoped for under the present arrangements, when their energies are not fully utilized or turned to the best advantage. In the future, the existing staff might, no doubt, be improved individually by the recruitment of officers with greater special acquirements for certain specific duties, but the officers to form the nucleus of a department exist, and it only remains to organize them into a harmonious whole. The Chemist, Botanist and Veterinary Surgeon would be most beneficially utilized in education; the agricultural officers on the practical work lying ready to hand in all parts of the Presidency. If agricultural education, developed as shown below, were a function of the department, the three former officers would also be able to fulfil special duties of advisers in their special branches to the Agricultural Department, at the same time as they were engaged in training subordinates for its executive work, and that training could be guided by a full knowledge of the end in view. Such an organization of staff into one special department would also be cheaper than the appointment of special officers to the individual posts, as the members of it would have a prospect ahead of them, such as individuals recruited for special posts rarely have.

"By providing in each taluk one Agricultural Inspector of the rank of a Revenue Inspector, who should have the supervision of all agricultural records and should act as a Travelling Inspector, such as is commonly provided in Ireland and Germany and as Cattle-disease Preventive Officer for his taluk."

Mr. Benson's views appear to be that there should be no separation of the Agricultural and Cattle Disease Department; that the subordinate staff should be

much larger, viz., at least one Inspector per taluk; that this staff should conduct all agricultural duties, whether those of inquiry, experiment, record, reporting, demonstration, teaching, combating cattle disease, &c.; that these men should be immediately supervised by experts in charge of divisions, all subject to the control of a Director, under whom should also be the Chemist, Botanist, Meteorologist, College staff, &c., all of whom are already available, and merely require to be brought into the organization. The method of their co-operation is not quite clear; apparently the scientific officers would be partly educationists, partly investigators, partly advisers to the Director; this part of the staff should be entirely separate from the executive officers.

117. There can be no doubt that, if the Agricultural Department is to be anything more than a name, the mofussil staff must be augmented and given definite work; it may be stated with confidence that not a single mofussil witness, whether official or otherwise, but will protest against trying to work through the ordinary district Revenue staff. Twenty-five years ago General Cotton protested on the ground that Collectors of Madras districts were the hardest worked officers in the world, and office work then was a trifle to the tale now demanded by the old and brand-new departments. Moreover, the officers are not merely too busy, but they have not the necessary knowledge; if the department is to do anything, it must be based upon an *exact* knowledge (*a*) of what is the practice, (*b*) of what are the conditions, (*c*) of what is wrong, (*d*) of the remedies advisable or possible; such knowledge is not attainable by non-experts; the conditions of the agricultural problem are too complicated, the remedies too obscure for casual amateur work however enthusiastic or zealous or well-intentioned. If the Agricultural Department wishes real inquiries and real work, whether experimental or positive, they must work through their own men and not through Revenue Inspectors, who are now the ultimate officials who answer questions, supervise experiments, and so forth. These remarks apply to technical agricultural work proper and not to those parts of the problem which demand a knowledge both of rural and social economy, and administrative organization (see paragraphs 102 and 103).

118. Mr. Benson has suggested the linking of other departments; among them are the Educational, as far as agriculture is concerned, the Forest Department, the Government Botanist, and the Meteorologist. It may be that the higher and special agricultural education as given in the college should be under the Agricultural Department; it is the officers of that department who best know what they want in their men, and who could therefore adapt the training to their wants; there are indications in the papers that the views of the technical officers and those of the Director are at variance; the former would make the men practical first and scientific afterwards; the latter would make them merely scientific officers, capable of becoming intelligent farmers should they take to farming. But agricultural education, in so far as it is a subject of general education, or a mere inculcation of elementary science, would of course be the duty of the Educational Department proper. The work of the Botanist is so essentially agricultural that it is difficult to understand the isolation of that officer, whose studies of crop-life, its conditions, variations and diseases, would be invaluable to the department. The Agricultural Chemist, though in Government employment, is not yet utilized as such, being merely the acting head of the Agricultural College. The linking of the Forest Department with that of the Agricultural is a difficult question. The principal object of the Forest Department is the benefit of the ryot, whether indirectly, by conserving his sources of irrigation, or directly by providing reserves of timber and pasturage. It is therefore obviously necessary that forest operations should be so managed as to safeguard those interests, duly balancing the needs, conditions, and interests of the present and of the future. Whether such interests are best guarded in the several districts by restriction or development of forest operations will always be of serious interest to an Agricultural Department, which should consequently have a controlling voice.

119. Obviously, the question of the controlling authority is of the highest importance, especially when it is considered that matters of pure agriculture, of rural economy generally, of revenue and general administration, of forest and educational work, are bound up together. It has been argued that the Agricultural

Department ought to be complete in itself, with a separate Director and experts as subordinates, detached from all control save that of Government, the difficulty of uniting the forest and other branches of administration with it being got over by suggesting an Advisory Board comprising the heads of the other departments and other officials besides non-officials, who should be consulted by the Director. Messrs. Robertson and Benson in particular object very strongly to the department remaining as a branch of the Revenue and more especially of the Settlement Department, arguing that the ryot is frightened at the idea of agricultural improvements if suggested by the Settlement Department; and that the confidence of the public and consequently its relations whether by correspondence or otherwise with the department, have already been destroyed or minimised by the reorganization in 1882, when Agriculture and Settlement were linked under one officer. These arguments appear unsound and prompted rather by Western ideas than by local considerations. In the first place, the Agricultural Department has always been under the Board of Revenue which has always controlled Settlement; hence the idea of a sudden loss of confidence in 1882, when a particular Member of the Board was made more directly responsible is untenable, especially as not one ryot in a million knows of or thinks of the change; he cannot distinguish between the various branches of the one Sirkar, and he does not look in such matters beyond the local officer. *Secondly*, it is not an absolute objection that the Revenue Department should be connected with the improvement of agriculture; representing in many respects the landlords of Europe they also resemble them in being improvers of the estates under their supervision; the landlords of England have been the pioneers of most modern improvements. *Thirdly*, the Agricultural Department is not merely concerned with agricultural matters proper, but is bound up with questions of rural economy and administration, and as such, only that body which has superior control over the administration generally, outside of the Judicial Department, could deal with the several questions; such a body is the Board of Revenue, which already has general control of the Forest Department. *Fourthly*, a department, outside the ordinary Revenue Department and not having any powers of its own, would be simply a nonentity without status, and without power to influence the village or other officers. *Fifthly*, the Collector, who is immediately subordinate to the Revenue Board, is still the only officer who unites in a district, control over all the several executive departments, and any district operations must take count of the Collector and his department. *Sixthly*, both the records of the Settlement and Revenue Departments, on the one hand, are essential to the Agricultural Department, and on the other, the inquiries of the Agricultural Department will enable juster operations on the part of the Revenue Department. In short, from considerations of policy, of the existing mode of administration, of utilizing existing and influential machinery, and of economy, it seems for the present to be absolutely necessary that the Board of Revenue should continue to control the Agricultural Department. The special experts should be the advisers and executive officers of the Board and not independent of it. It is well known that the Board with its subordinates are not mere "Revenue" officers, any more than Collectors are merely collecting officers, but are accustomed to deal with the wants of the ryot in all matters of rural economy; to divorce from their control that branch of administration which peculiarly deals with matters within their knowledge, and to ignore the enormous mass of general knowledge and of influence which they possess, would be a grave error. A distinct and continuous policy, rough-hewn possibly by this Committee, and the subsequent orders passed on its recommendations, shaped by the Board of Revenue through its Agricultural Member, and worked out in detail by the special experts under the Board, seems the desideratum for the future.

From reports on the Agricultural Departments of Foreign countries—Blue Book, 1884.

120. The Agricultural Departments of other countries may be briefly mentioned here, to show what is done in countries which—to quote the Secretary of State—have less interest in the improvement of agriculture than the Government of India, but in which it is found that owing to the comparative absence of large landholders of much public spirit and enterprise, the Government must supply the necessary

stimuli, aid and direction. France has a large department in four bureaux; these deal with every conceivable subject including irrigation, forests, fisheries, statistics and trade, agricultural education of all grades, stock-breeding, &c., &c. The Ministry is assisted by a superior council, dealing with agriculture, forests, irrigation and stock; this is purely consultative, consisting of Agriculturists and Members of Parliament. It appears to be unpaid. Besides this consultative body, there are standing committees on all the important heads of operation. There are numerous agricultural institutions and chairs of Chemistry and Agriculture; national schools, practical schools, school-farms and farm-schools, veterinary schools, forest schools, classes for agriculture at every primary normal school. Besides this, there are in most of the large towns of each department, "consultative Chambers of Agriculture," by whose agency the Minister is made acquainted with the wishes and wants of the agricultural community; there is also a scheme for similar Chambers in every circle of villages. There are also numerous voluntary associations. But everything and all associations are under the control of the State which initiates and pays for most; the State does the work entrusted to voluntary associations in England. There is also a special order of merit for agricultural services. The expenditure, exclusive of all charges for forests and irrigation, is about 120 lakhs; State aid to encourage drainage of fields, agricultural associations, exhibitions and prizes, is about 8 lakhs.

Prussia has also a large Agricultural Department, dealing with agricultural education (costing $4\frac{1}{2}$ lakhs), veterinary science ($3\frac{1}{2}$ lakhs), numerous agricultural laboratories (1 lakh), stock and horse breeding (3 lakhs), forests, fisheries (1 lakh), besides several other branches, and the cost of a central "High Court of Agriculture" and subordinate committees. The Austrian Ministry of Agriculture pays much attention to instructing agricultural teachers who are sent through the empire to aid and advise the farmers; in 1883-84, 2,721 were in attendance at 69 schools, and 1,014 passed in 1881. There are also itinerant instructors, whose services are not much appreciated. The other usual operations are also attended to.

In Italy, the department deals with numerous other branches of industry, including forests, besides agriculture proper, so that the cost cannot be apportioned; since its organization, it has "founded agricultural committees, local exhibitions, schools of instruction, and experimental stations. It has made accurate studies and reports and has published important treatises on special subjects."

In Denmark, all subjects of rural economy are dealt with, including the higher branches of agricultural, forest and veterinary education, and the control of mutual credit societies founded to aid farmers in getting loans. The Ministry is assisted by the Royal Society of Agricultural Economy, which, though a private society, is subsidized by the State. There are also sixty Agricultural Societies who receive subsidies from Government and carry out much of the work of a department, under the encouragement of the department; in fact, most of the work in Denmark is done through societies rather than direct. No less than $2\frac{1}{4}$ lakhs are devoted in this small country to purely agricultural encouragement, altogether apart from educational work except at the Royal Agricultural and Veterinary School, which gets nearly 1 lakh out of the above $2\frac{1}{4}$; of the remaining $1\frac{1}{4}$, about Rs. 11,000 are given through the local societies, as prizes to small farmers, for the best-managed farms, where at most one horse is employed; the object is "to encourage that kind of cultivation which is well within the reach of the small peasant farmers, such as work with the spade, &c., or the cultivation of some peculiarly remunerative produce." The remaining $1\frac{1}{8}$ lakh is spent in "subsidies to aid in the rearing of stock" (Rs. 38,000) veterinary expenses, the aid of credit societies for the use of small farmers (Rs. 15,000), a farmers' congress (Rs. 8,000) and other items.

Sweden spends directly $3\frac{1}{2}$ lakhs on actual agricultural work including its agricultural schools, stock and horse breeding, farms, dairy farms (15), forestry and veterinary departments, prizes, travelling fellowships for the study of foreign agriculture, travelling and other instructors, &c., besides 6 lakhs in advances for agricultural improvements. In addition to the above outlay, no less than 8 lakhs, being one-fifth of the tax on brandy, goes to certain Provincial councils and agricultural societies; the Provincial councils apply themselves to the study of economic, agricul-

tural and sanitary questions, and in 1881-82 received a grant of $3\frac{3}{4}$ lakhs; the twenty-six agricultural societies apply themselves to agricultural improvements, exhibitions, &c., and in 1881-82 received $4\frac{2}{3}$ lakhs as their share of the brandy-tax. The central authority is called the Royal Academy of Agriculture and was founded in 1811; "the development of agriculture in Sweden coincides with the foundation of the Academy of Agriculture and is due in a great measure to its initiative. Agriculture at the beginning of the century was in a most elementary condition; the grass lands were in a more or less wild state, the cultivation of fodder was unknown, and the breeding of cattle entirely neglected. The agricultural implements in use were of the most primitive construction and make." The above words apply very closely to Southern Indian Agriculture at this day. But Sweden is now in a very prosperous agricultural condition, at least *partly* due to the initiative of the Agricultural Department; cattle-breeding, dairying and farm produce are all much improved, and it is well known for its manufacture of good implements.

Belgium is, of course, very advanced; there is a Ministry of Agriculture, which looks after every branch, not neglecting indirect encouragements, such as "decorations to farm laborers!" An advisory and deliberative council, receiving travelling allowances but no pay, assists the Minister; this is mainly composed of members elected from the provincial commissions of which there is one in each province (district), consisting of practical and theoretical agriculturists, a veterinary surgeon, and a paid secretary. These commissions deliberate on all agricultural matters for their own district, give advice and information, carry out demonstrated improvements, and help to enforce measures passed in the interests of agriculture; the members receive travelling allowances, but no salaries. The nine provinces (districts) are divided into 119 districts (taluks) each with its voluntary association approved by Government; these are the immediate introducers of agricultural improvements and sources of information; they are executive (non-official, of course) and consultative. All land-owners, not legally incapacitated, are eligible as members of the Taluk Associations. The budget allotment for agricultural purposes is about 5 lakhs: there are also communal payments.

The United States does much, though not very directly, except in the matter of seed distribution and the supply of correct and punctual information, whether of agricultural facts or markets. But in spite of the extraordinarily advanced character of its people, it is there regarded as a grave error and a source of surprise that Government has as yet done so little for agriculture, while it has done so much for other industries and for commerce, and that people should be found to consider that agriculture can take care of itself; a new departure is, it is believed, now being made. Even in England where State interference in enterprise and industry, especially agricultural, is exceptional, the recent tendency is to seek for and to give Government aid, not merely indirectly as by an intelligence department, but directly as by grants-in-aid of agricultural education and in other ways. If this is the case in England and in the United States where individual intelligence and independence and dislike of State interference are so great, is it not much more necessary in this country to give fostering care and direct aid to agriculture? In the words of the Government of Lord Mayo in 1871: "In almost all civilized countries in which the form of Government is centralized, the efforts of the people are aided by the co-operation of a State Department of Agriculture which works in part directly through its own agency, and in part through agricultural and other societies. The work that is performed by the great agricultural societies of Europe must be performed in India by the Government or not at all."

121. Apart from the money spent in the above countries, it will be seen that consultative or advisory councils and associations are prominent features of the Agricultural Departments. The Belgian system is especially complete with its taluk associations who nominate to the District committees, which in turn elect to the superior council. Similarly in Wurtemburg, there is a Bureau of Industries, partly official, partly non-official, the former consisting of the chief officers of the several branches of the department, the latter of the members of the District associations. Mr. Benson made a similar suggestion for Madras in 1885, as follows:—

"I enclose sketch for a 'Board of Agriculture' something after American State style.

"The annual convention would bring in the representative element and also form a body to enable us to get at the ideas of the people better than we now can. It might be made a useful means of diffusing information and could be held in connection with the exhibition scheme, Government allowing travelling expenses to representatives.

"Six members of the Board might form a quorum. The nominated members might be—

1. Principal or Professor of Agriculture } in Agricultural College,
2. Inspector of Cattle Diseases,
3. Government Agricultural Chemist or Government Botanist,
4. Senior Conservator of Forests,
5. Chief Engineer, Irrigation,
6. Government Entomologist (when appointed),

besides the two *ex-officio* members.

"By way of a beginning, Government might nominate the other six members as follows:—

1. Secretary, Agri-Horticultural Society.
2. Mr. Sabapathy Mudaliar.
3. Mr. Krishnaswami Mudaliar.
4. Mr. Vencatachariar of Tirupatúr.
5. Chairman, Chamber of Commerce.
6. Representative of Planters' Association, Nílgiris and Wynaad.

"Such a Board might meet definitely, say in September (to discuss proposals) and March for convention, besides other times as seemed advisable.

"As a beginning all our 'District operations' might be handed over to it, as well as exhibitions."

"Madras Board of Agriculture.

Advisory Board to which several questions of agricultural interest should be submitted and which should have direction, as far as possible, of agricultural operations of Government.

Business.

To hear and discuss proposals of Board for ensuing year.

To read and discuss papers on agricultural matters.

To bring to notice of Agricultural Department points affecting agricultural interests of country.

President—Director, *ex-officio.*

Secretary and Treasurer—Agricultural Reporter, *ex-officio.*

Directors—

6 nominated by Government.
6 elected by annual Convention.

To meet as summoned by President.

An annual Convention to be held at such time and place as Board select, and to it

All Local Fund Boards,
Agricultural Societies or Clubs and Associations,
Chambers of Commerce,

to send representatives and such persons as Board suggest to be invited to meet."

122. This was more a consultative Board than an active Association. In 1887 a district officer wrote as follows:—

"I consider that both for this and for agricultural experiment and progress generally, local associations are absolutely necessary. It is impossible to conduct experiments either by officials or by isolated ryots; the former are too busy and too inexperienced; the latter are too shy and conservative, too half-hearted and sceptical, too careless of the result of supposed official fads. We ignore at present the large amount of experienced indigenous agricultural talent; we fail to utilise a vast and trained force lying to hand because we have failed to organize it into a phalanx, and to combine scattered units into one organized whole, and to bring them into rank with our own forces. If competition is the 19th century watchword, association is doubtless advancing claims for the 20th century; this bond alone can unite the *disjecta membra* of the agricultural body politic. I consider, therefore, that we should organize in every district agricultural associations; not isolated societies, dependent upon, perhaps, temporary local knowledge or interest and enthusiasm, but, while possessing local life and organization, dependent for permanent life and inspiration upon a central organization with head-quarters at the Presidency town. The central organization would consist of all the best talent and knowledge available in the whole Presidency, worked officially in your department, but corresponding and having frequent conferences with its members in the districts. These members would of course be principal members of the district associations, which in turn would have members in every chief town and village in a district. The result would be not only that the central association would be supplied with the correctest and best information on all agricultural and rural topics, but would supply information in turn even to the remotest villages, and all this at the least

possible expense. Not only so, but real experiments would at last be possible and popular; at present a ryot, if induced by a tahsildar to take up an experiment, is not only sceptical and careless, but rather ashamed of departing from ancestral methods; the result is, of course, failure. But if experiments, wisely chosen by an agricultural bureau composed as above, were entrusted to local associations and by them to selected members, these latter would not only have the whole intelligence, skill and resources of the association at their back, but would be rather proud of being selected as delegates, while the experiments, as the suggestions of men of local status, would command greater interest and faith than officially-ordered trials. Moreover, many suggestions are now obliged to be put aside because the Agricultural Department cannot find time or space to work at them; the associations would supply a thousand hands and a thousand acres if need be. The results of experiments, moreover, would be rapidly spread over a district, instead of being confined to the pages of the District Gazette. Finally the associations would provide the talent necessary for stimulating and judging competition in prize farms, exhibitions, school farms and the etceteras of agricultural progress. These and many other results will follow skilfully-formed associations.

"In forming them we shall but follow in the footsteps of the West; in England the Royal Agricultural Society, I believe, is the centre of English-farming talent, and local associations are affiliated to it. On the continent, I believe, that a bureau of industry usually supplies the primary stimulus, and local associations obtain suggestions, aid, money grants and so forth from the bureau. One of the most perfect of these departments appears to be in Wurttemberg where there is a bureau of industry partly official, partly non-official, with head-quarters at Stuttgart, the non-official members residing in all parts of the kingdom but coming up for conferences, and being of course in correspondence with the central bureau. This bureau has had the most extraordinary effect upon all classes of industry, agricultural or otherwise (*Contemporary Review*, October 1886), and it is upon this model that I would form our own association."

Sir Madava Rao has already laid before the Committee an opinion to a similar effect, viz., that the department should be a complete organism with the best talent available as the thinking head, and numerous district and rural members as the working hands. It is certainly possible to form such associations with every prospect of success. The improvement of agriculture comes home to every mofussil resident, who is always a land-holder, and the prospect of improving his own gains, the feeling of philanthropical public spirit, which is certainly not absent, and the position of influence at a quasi-official Board, with the chance of honorary titles or other insignia, would be well appreciated. There will be no question of taxation or of officialism; the associations will be entirely self-motive, deriving, however, their initial impulses and their continuity of action from a central source. It is by means of such societies that the desire of the Government of India (see paragraph 24 *supra*) to associate the most influential members of society in matters of agricultural progress, and the wish of members of this Committee to provide an organization which shall reach right down to the ryot, will be brought into effect. In the North-West Provinces a Provincial Association was formed in 1886 which, within a few months of its formation, gave substantial help and advice to the Director "in a manner and to an extent which, sanguine as I was, I had not anticipated" (Report of the Director of Agriculture for the North-West Provinces, 1886).

123. *Agricultural education.*—This appears to be one of the most important matters that the Committee have to deal with; it is not merely a question of high technical education but of the practical education of the farmers themselves through whose intelligence and skill progress must really come; no part of the farmer's holding better repays cultivation than his own head. Undoubtedly, one great reason why the European peasant is successful, is the good general education which he is compelled to receive; another is the facilities given him for education in his special business; his general education fits him for the duties of a man and a citizen, but he is also given the opportunity of specially fitting himself as a farmer. Before discussing Madras facts and proposals, it may be well to point out Continental facilities, of which some account has already been given in paragraph 120 *supra*.

"In France, elementary agriculture is taught in primary schools, where children learn to distinguish between plants, grasses, and soils; often a plot of ground is attached to the school which serves as an experimental farm. The school-teachers are supplied with training in the subject by departmental professors, who, under the direction of the Minister of Education, give courses of lectures in the *écoles normales*. The rest of the system of agricultural education falls under the Department of the Minister of Agriculture. Three classes of schools are provided:—(1) the *fermes écoles*; (2) the *écoles pratiques*; (3) the *écoles nationales*. The *fermes écoles* are numerous and useful. Many of these primary agricultural schools were founded by private

enterprise after the Restoration, but in October 1848 they were recognised as part of the administrative system of the State. Lads enter these schools as apprentices, not as pupils. They must not be over 16 at the time of entrance; they are fed and treated as labourers; they go through a course of two or three years, and at the end leave the school with a certificate which qualifies them to act as bailiffs. If they show decided aptitude, they may obtain a bursary, at one of the *écoles nationales*. The yearly cost of each farm pupil to the State is £10; the State also defrays the expenses of the salary of the Director and his Assistants. The Director obtains the labour of the pupil for nothing, and manages the farm for his own profit and at his own risk. The *écoles pratiques* are assisted and superintended by the State. It was intended that there should be one school in each of the twelve regions into which France is agriculturally divided. These agricultural high schools are designed for the sons of the wealthier class of cultivators. The cost is from 400 francs to 500 francs a year. The pupils learn practical agriculture and the elements of physics, chemistry, natural history, botany, veterinary science, and stock-breeding.* They have not proved particularly successful; the best known is that of Merchines (Meuse). The three *écoles nationales* are placed in the centres of three districts of France. The Institut Agronomique, which crowns the fabric, forms a faculty of agriculture.

"Besides these schools in the general practice and science of agriculture, there are special schools, such as the sheep-farm at Rambouillet, the gardening establishment at Versailles, the school of drainage and irrigation at Lezardeau, near Quimperlé, the three veterinary schools of Lyons, Alfort, and Toulouse, and the *écoles de dressage* like that near Caen. In 1879, departmental professors were appointed, whose duties are two-fold. Under the direction of the Minister of Education, they lecture at the Normal schools to pupils who are being trained as schoolmasters; under the instructions of the Minister of Agriculture, they hold conferences with the agriculturists, teachers, and proprietors of each canton, perambulate all the country villages to observe agricultural processes, keep in touch the various local societies and spread the knowledge of improvements. By the Law of June 16, 1879, each department is to be provided with a professor, and their agricultural duties were minutely defined in a circular of M. Tirard in 1881.

"France has, then, an organized system of education which works with great efficiency, and to which it annually devotes £70,000. It is designed to encourage men of science to experiment in chemistry and machinery, to afford practical as well as theoretical instruction to landed proprietors, agents and farmers, to train up intelligent peasant proprietors and labourers. For these objects there are four grades of schools. In many of the primary schools agriculture is taught, and to some of the normal schools land is attached for practical teaching; each department already is, or shortly will be, pervaded by a peripatetic professor.

"In the Austrian Empire, the School of Krumman was founded so far back as 1799. There are now, scattered through the country, three superior, four middle-class, and seven lower agricultural schools; there are also several special establishments in which instruction is afforded in such branches as shepherding, bee-keeping, grape and orchard management.

"The dairy schools of Denmark have already enabled Danish farmers to rival English produce in London markets. Belgium, Italy, Norway, Saxony, Sweden, are all more amply provided with means of general education in agriculture than England. In Prussia, more than thirty institutions teach the practice and theory of agriculture; Möglin, founded in 1806 by Thaer, the Arthur Young of Germany, offers education of the highest class; Annaberg trains peasant farmers and bailiffs; in twelve primary schools agricultural pupils act as hired servants, and do the work of the model farms; itinerant teachers are paid by the Government to travel from village to village. There are also thirteen special in which such subjects as meadow culture, flax-dressing and gardening are taught.

"After the emancipation of the serfs, Russia recognised the urgent need of spreading among the mass a rational knowledge of agriculture. She has her agricultural museums, her three grades of primary, secondary, and higher education, as well special schools adapted to the wants of different districts. Bavaria, besides large institutions at Weihenstephan near Munich, Lichtenhof, and Schleissheim, has agricultural sections in all the technical schools. Hesse possesses an Agricultural college at Darmstadt, open to young farmers from November 1 to March 31. Courses are given for the benefit of National school masters; botany, physics and chemistry are taught in the National schools; *Wanderlehrer* impart instruction in the villages, visiting their circuits every year, so as to be able to note improvement.

"Württemberg is especially well provided with means of agricultural education. Besides the Royal Institution of Hohenheim, there are three school farms, an agricultural chair at Tübingen and a veterinary school at Stuttgart. On many large farms there are apprenticed pupils preparing for Hohenheim. Voluntary winter schools, obligatory evening schools, and lecture meetings enable farmers to keep pace with the latest scientific discoveries. Practical agriculturists, in the pay of the State, visit the different districts, discuss special branches of farming, and co-operate with local associations in experiments and improvements. In all these countries, admirable means exist for diffusing agricultural knowledge, and bringing home to the smallest farmers the best modes of cultivation. Scientific instruction is given in a practical form and in a shape which is easily comprehended."

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* Successful and increasing according to Major Craigie; pupils and neighbours are shown how to employ natural resources to the best profit; neighbouring farmers are eager to take advantage of the demonstrated results; *e.g.*, of the use of new wheats of larger yield than the old varieties. (Major Craigie's Report on French Agricultural Instruction; 1889.)

The above extract is from Prothero's "Pioneers and Progress of English Farming" (1888).

124. In this country, education, meaning thereby the training of the coming race of ryots whether in class or on the farm, whether in the principles of agricultural science or in principles with practice, has not yet been tried as an agent of progress: it has never been really introduced into the curriculum of mofussil schools whether primary or secondary: the Saidápet College is shown above to be a mere isolated fact; wrongly recruited, admittedly unsupported by any practical training, discouraged and rendered abortive by the want of any distinct future for its graduates, it is practically disconnected from the existing administration and without place in any special organization. Its graduates have found little or no place; only in the Stock Department have specially trained men found a distasteful occupation. The questions now for consideration seem to be (1) the desirability and necessity for a real education of the ryots in the conditions, principles and methods of agricultural and rural economy; (2) the nature of such education; (3) the methods of giving it.

125. There seems to be an entire consensus of opinion that education is an absolutely essential factor in agricultural as in other progress; the past history of the department, as given in paragraphs 8—20 *supra*, bears witness to this, and even those who disbelieve in the feasibility of direct and positive improvements look to "time and education" as the agents for development; no one in fact doubts that industrial efficiency is intensified by mental development; that superior intelligence means better work and, materially, more and better produce and enables a ryot to adapt himself more readily to altered or altering conditions. The question of education by example and stimulus, as by exhibitions, prize-farms, demonstration and school-farms, agricultural stations or depôts, by implement shows and competitions, has been dealt with above *passim;* it is only necessary here to remark that if the ryot is really dull, stupidly and unreasonably bigoted, as some would say and have said, then there is the greatest possible urgency for stimulating him and educating him by demonstration and example in every possible way, for that progress without him is impossible; if, on the other hand, he is only cautiously conservative, shackled by custom only because no better way has been demonstrated, ready and willing to adopt such better way if demonstrated, then demonstration and example are equally necessary as the pioneers of sure and certain progress. It remains then to consider the question of education as generally understood, which is either general or technical. For the purposes of this Committee, general education may be taken to be that supplied to the ryot class generally; technical education will be that supplied to those who require further instruction in the science of agriculture (*a*) whether in secondary schools, as young men intending to supervise their estates or enter Government service, (*b*) or in colleges for the purpose (1) of becoming teachers of agriculture, (2) of obtaining superior posts in the Agricultural or Revenue Departments.

126. With general education in its elementary stage, the Committee are deeply concerned; it may be remarked introductorily—

(*a*) that special or technical education cannot be usefully introduced without good general education; it is not technical education alone, but technical with general culture that has worked so much for Germany and Switzerland, and hence the perfecting of general and elementary schools is at least as important as technical education;

(*b*) that, if the methods and subjects of general education are such as to repel or even not to attract the ryot classes, such methods and subjects must be amended, seeing that nearly every one in the country holds lands, and that over 70 per cent. are actually ryots and cultivators;

(*c*) that, if the ryots are to be attracted to education on the one hand, and on the other, retained and strengthened in their attachment to rural life, the education must be suitable to their wants and must probably, after passing a certain stage, bifurcate from the ordinary course; it is not ordinarily desirable that the ryots' children should, after reaching a certain platform, climb that "ladder reaching from the gutter to the university," which seems to be the only present stairway available.

(*d*) that any changes in the educational programme and methods which may be necessary to this end may fitly be considered and urged by this Committee.

127. Probably, it will be deemed that education is only education really when it brings out (*a*) the powers of observation, (*b*) the powers of thinking upon the results of observation. Obviously, without such training, no ryot can ever develop his practices, or adapt them to new or altering conditions. If the education merely quickens the memory with a minimum effect upon the powers of observation and reasoning, it is of little avail. Is not the ryot's ancestral method of education both the result and cause of his state of mind? Shut up within narrow village or tribal limits, his thoughts and practices became stereotyped, and his education consequently demanded merely a knowledge of accepted precepts and practices, many of which, in fact, crystallized into proverbs; all that a man had to do was to learn what his forefathers had gained knowledge of by sheer experience; given certain conditions, varying indeed but only within certain limits, the ryot had merely to consult his memory as to what is to be done. Under such circumstances, real education was unnecessary and even impossible. The consequence is that, with the present altered and altering conditions, the old education is failing just as the old practices fail; the ryot is in difficulty, because his old precepts were framed under other conditions and do not suit new ones. Professor Wallace indeed considers the ryot masses to be men of marvellous observing powers; be this as it may, if it be true that he is very observant, then a system of education which teaches *by means of* and *about* the objects and affairs of everyday life is the one system that is likely, if introduced, to be successful; if he is not observant, then *à fortiori*, it is all the more necessary.

128. The specific object of training the observation and thinking powers of a ryot is, so far as this Committee is concerned, to make him a better and more adaptive cultivator; the Committee is only concerned with him as an agriculturist. If it can be shown that the course of education in and by agricultural and rural matters may be so arranged for him that it makes him a better agriculturist because it intellectually develops him, the objections of those who fear that general education will be neglected for technical education will fall to the ground. It has been so objected; Professor Wrightson argues for a sound general education of the ordinary character, leaving the technical part to be learnt on a good farm, preferably that of the boy's father; the Rev. L. Frohnmeyer of Tellicherry, replying to a proposal for rural agricultural teaching, considers special teaching at school to be a mistake. But it has never been proposed by any exponent of agricultural teaching in schools that special education should oust general education; the former was simply to *supplement* or be associated with the latter, and the latter was to be improved by teaching *through* and *in* the objects of daily life. No one doubts Professor Wrightson's position; actual farm practices should be learnt on a good farm, and education should be sound; the question are (1) what is a *sound* education for a ryot? (2) where in this country will he learn improved practices?

129. Probably, it will be considered that a sound education for any man is one that best fits him for the duties in which he will be engaged; for a ryot, therefore, that which best fits him to go forward in agriculture is a sound education. This being so, what is his present education? Remembering that the proportion of actual pupils to boys of a school-going age is very small; that a very small number ever pass even the 3rd standard, probably only one-fourth of those who pass any standards at all; that not 1 in 20 of those who pass any standards ever reach the fourth; that the education in the above standards is confined to a very limited acquaintance with the three R's; that, as a rule, the teaching even of these matters is of very poor quality and deals more with repetition by rote than with the development of the mental faculties, whether of observation or ratiocination; that lads who have attained this limited knowledge have no subsequent chance of exercising it, in that there is no modern vernacular literature and the poetical literature is unintelligible to them, writing is seldom wanted, and arithmetic too absurdly deficient to be of practical use; that consequently this limited knowledge is soon forgotten; that the information gained by this education is of very limited character in itself, has little to do with the facts of a ryot's everyday life, while it has occupied the maximum time in

being acquired; remembering these facts—based largely upon personal experience and corroborated by several Inspectors of Schools in the criticisms passed upon a proposal for the alteration of elementary education,— it may be considered that the present elementary education is neither sound nor sufficient.

130. A sound education is surely one which interests the ryot; one which appeals to his daily life; one which teaches him about the objects surrounding him; one which teaches him *about* things and *by means of* things; one which teaches him new thoughts about and to think about things; one which is carried on into and by his subsequent daily life; one which suggests modes of action not so much didactically as by displaying the principles on which his practice is based, the conditions under which he works, the causes of the difficulties which he feels, the methods elsewhere adopted and the results of such methods. It seems perfectly possible to give such teaching in elementary schools; not of course in *all* elementary schools, but in so many that a very great result could be obtained within a measurable time and by measurable and limited means. It is to be remembered that if such schools are practicable, a period of five years from their being fairly started would see an immense number of lads trained, and every successive year would add largely to the number; it is not a question of long generations if the schools are possible at all; a hundred such schools in a district—say one in every ten existing schools—would have a very great effect in a very short time. The necessity for these schools is being everywhere recognized; in France, the law of 1879 renders them compulsory; in Germany, they are numerous, but the theory is taught rather than—as in France —theory with practice; Switzerland has long had them and Mr. Keess from personal experience testifies to the wonderful effect on the Swiss peasant "who would not think of engaging in agricultural pursuits without a sound preparatory training" (compare extracts from Kay's "Free Trade in Land" elsewhere quoted). Ireland has adopted and is adopting them, and even England, the land of agricultural laborers, is now adapting its educational scheme for rural schools towards the same end.

Papers in Board's Proceedings, No. 277, dated 15th August 1887.

Papers in Board's Proceedings, No. 277, dated 15th August 1887.

131. The French and Irish plans may be described in the following extract:—

* * * *

3. Taking the French system first; this forms part of a complete plan of agricultural education, which, as usual in France, is *confectus ad unguem*, and has the merit of being "eminently real and practical" (p. 94). The recommendations of the Commission of 1866 were largely embodied in the law of 1879, and were, amongst other items, to create the post of Professor of Agriculture in each department who is to be "charged with agricultural teaching in the Normal school," to "encourage the addition of a garden to such normal and rural primary schools as do not at present possess one, in order to exercise the children in the practice of horticulture," to "modify the regulations of the communal primary schools" so as to fit in class studies with field work, and generally to direct the aims of rural teachers in an agricultural direction whether in the matter of their dictations, reading lessons, or lectures; these recommendations were to be enforced by inspections of the normal and rural schools by an Inspector of Agriculture, and encouraged by premia both to teachers and pupils (p. 96).

4. The scheme for the normal schools expressly provides for the combination of practice with precept, though not to the extent advocated in previous suggestions borrowed from the Swiss plan. The syllabus as given on pages 146—149 for normal school agricultural instruction is sufficiently wide, and, if fully combined with practice, will make agricultural instructors of the teachers.

5. This system has apparently only just been adopted (1880) and its results are yet to be seen. The obvious complement, however, of this scheme is that of similar instruction in elementary schools, and it is accordingly provided (pages 145 and 340) that as soon as agricultural instruction in the normal primary schools has been completely organized for 3 years elementary instruction in agriculture shall be included in the compulsory subjects of primary education.

6. Primary education in France is for children between 7 and 13 years of age (p. 149), and the scheme of agricultural instruction for the primary schools in which these children are taught is for 3 courses, viz., fron 7 to 9, from 9 to 11, and from 11 to 13. The point which I wish here to bring out is that, from the beginning, the children are to be taught "in the garden" (p. 150); from the very first the instruction is to be by practical object lessons. The subsequent courses are both field and school lessons, but a glance at the syllabus on

p. 150 shows that most of them must be in the field or garden, seeing that it deals with implements and manures, soils and drains, grafting and crop culture: the education is by contact with "concrete realities," and these realities are those connected with their everyday life. The garden or even the "Champ d'études" is an essential part of the school equipment. Hence the French plan to a large extent embodies in a system what I have made as a mere suggestion, viz., to teach the lowest agricultural classes in matters relating to the industry by which they get their livelihood, and to do so not by books, but by practice aided by precept in books, exercises and oral teaching. Pages 152 to 161 mention some examples of this teaching even prior to its systematic adoption. Pages 339 to 360 (appendices) give further details of the French scheme, and I would merely call attention to page 347 in which the aim of the rural school teacher is defined to be that of interesting the children in natural and rural phenomena, in imparting elementary biological knowledge, in developing their innate tendencies, and in implanting good ideas, so that the child may learn more about its industry, and, as a man, be more able to reason out his operations and improve his processes.

7. The Irish plan is described in pages 267—293. The importance of agricultural education was perceived, so far back as before 1823 (p. 267), and the Commissioners of National Education began in 1838 by establishing a farm at Glasnevin where normal school teachers could go for training in order to be qualified for teaching agriculture in their several districts when they returned to their own schools; the Agricultural Improvement Society about the year 1847 stated as their opinion that "every national school in Ireland should be an agricultural school if situated in a rural district" (p. 268), and this was similarly the idea of the Education Commissioners, whose primary intention was to blend agricultural and literary instruction. This idea was, however, largely neglected in favor of the more seductive plan of model farms, so that in 1851 there were but 39 national rural schools in which agricultural instruction was at all given: from that time, however, it began to revive and in 1873 there were 115 such rural schools teaching 4,200 boys (p. 269). It will thus be seen that the first step was a farm for the practical instruction of normal school teachers, who in their turn were to give agricultural instruction in the rural schools.

8. The same scheme is so clearly and interestingly put by Sir P. Keenan in his letter printed at pages 271 to 281, that an extract or two will be worth quoting: he says, "concurrently with the operations of the Templemoyle School came the first attempt of the National Board to diffuse a knowledge of agricultural science amongst the people.

"It suggested itself to the Commissioners when Parliament was first invited by them to vote funds for agricultural education, that the most efficient plan to spread a knowledge of sound principles in agriculture would be to make it a subject of instruction in the normal school for the training of teachers in Marlborough Street. This was in the year 1838.

"A lecture upon agriculture was accordingly given to the students of the normal school daily. Without expository instruction upon the farm, it was however conceived that this lecture would be productive of somewhat comparatively barren results. It was therefore determined by the Board in the same year 1838 to take a farm at Glasnevin, in the vicinity of Dublin, to which the literary students in training might have easy access, and upon which they might see, practically carried out, the plans and system of agriculture and horticulture recommended in the daily lectures.

"This, in point of fact, was the origin of the agricultural department of the Irish national system of education.

"It is particularly important to observe this. The Glasnevin farm was not designed merely to bring up a race of skilled stewards and skilled practical farmers. Its original and primary purpose, on the contrary, was simply to qualify the ordinary elementary schoolmasters to instruct their pupils in the theory of agricultural science, and, where practicable, in school gardens and small farms attached to the national schools, to illustrate their teaching by reference to the operations on the gardens and farms.

"The Commissioners explicitly stated at the time in their report presented to Parliament that their object was not to teach trades, but to facilitate a learning of them by explaining the principles upon which they depend, and by habituating young persons to expertness in the use of their hands.

"The function of Templemoyle was exclusively to produce skilled farmers; that of Glasnevin, as I have said, was mainly to qualify elementary teachers to instruct the pupils of rural schools in the principles of agricultural science.

"The idea of engrafting agricultural instruction upon the ordinary curriculum of an elementary school was accepted in the country with positive enthusiasm. Landlords and others who, on religious and political grounds, hated the national system, turned invariably to this feature of the operations of the Board with the greatest favor.

"The Devon Commission in 1843 hailed the project and recommended the establishment of schools for agricultural instruction throughout the country. Agricultural societies and leading public men expressed their approval of the proposals with unstinted cordiality."

Sir P. Keenan then details the beguilement of the Board into the model farm system, its comparative failure, and the gradual revival under Lord Spencer of the school farm or garden system (pp. 275-6). The Board of Education then returned to their old idea, viz., that of organizing every national school as an agricultural school, and laid down agriculture as an

obligatory subject above the 3rd standard; so that in 1881, 37,476 boys were examined and 18,517, passed. Apparently, however, the instruction was chiefly from books by book-taught teachers, for the Board found the necessity for giving all national schoolmasters some practical instruction in addition to the mere book knowledge required for a teacher's certificate (p. 279), and sent a number of them for six weeks to the Glasnevin school; this was but a poor substitute for real practical training. Moreover, these book-taught teachers only taught their boys from books, for, as stated above, in 1873 only 115 schools with 4,200 boys and in 1881 only 93 schools had school farms or gardens for actual practical work.

9. It will thus be seen that though the necessity for agricultural education in which instruction should be blended with practice was early and widely recognized, the idea was but very partially and imperfectly carried out; the system was largely stunted by the diversion of attention and funds to other modes of agricultural education, which were to a great extent delusive and at the best the idea has been but slightly worked till after 1873. I would merely point out the consensus of opinion in favor of the very idea which I have suggested for my own district and possibly for others also.

10. Pages 318—328 are occupied with the Sub-Commissioner's own recommendations. Mr. Jenkins' position as Secretary of the Royal Agricultural Society, and his immense practical knowledge of all systems both of agriculture and agricultural education as shown in his reports to the Agricultural Commission as well as in this report, give great weight to his opinion, and the Commissioners accordingly adopted his report as their own. He has much to say on the subject of the school books, of which more hereafter, but assuming as an axiom that children from the earliest age should be brought into contact with "concrete realities" and taught by their means, he mentions with approval the suggestions of Mr. Bailey Denton and Mr. T. Wilkinson as to the necessity of school gardens, but in comparing this plan with that of the French one above mentioned—viz., that children from seven to nine years of age should be taught practically in the school garden as the *beginning* of their technical instruction, and that the school garden should be cultivated by the pupils under the schoolmaster—gives his opinion in favor of the latter as a means of instruction, but would reserve further land for prize-plots cultivated by senior pupils.

11. School-books, specially devised for such rural schools, would seem to follow as a necessity, even for schools which have no farms or gardens attached. I do not presume to treat this subject, but would merely refer to pages 152, 171, 318—323 of the report.

12. The prize system both for teachers, pupils and farmers, adverted to on pages 153, 159, 246, 276 and 292 and elsewhere, is one that seems especially suitable to this country; substantial prizes for model gardens, farms, *homesteads*, cattle-sheds, manure-sheds, stock bulls and such like appear highly deserving of support, as probably productive of greater and more permanent results than those of occasional exhibitions; a village prize garden, or bull, or cottage holding would be a permanent exhibition and stimulus to the surrounding ryots.

The references in the above extract which is from a district officer's letter are to volume II of the report of the English Commission on Technical Instruction.

The following extract from the same volume of that report is also interesting:—

"In South Germany, more particularly in Württemberg and in the Rhine Provinces, large efforts have been made to teach the lowest classes of agricultural society the elements of their callings; and, more recently, a system of organization for the same purpose has been completed in France. In these foreign countries the basis of the instruction is the facts and objects of agriculture, as opposed to the English system of teaching principles. The arrangements I have already described in detail under their several headings of travelling lecturers, training schools for teachers, elementary instruction in agriculture at primary schools, school gardens, and experimental plots. It is doubtful, however, whether in any European country there can be found so practical and apparently so successful a system of teaching practical agriculture to the children who attend elementary schools in rural districts as that which exists in Ireland, and which has been so clearly described by Sir Patrick Keenan (pages 271 to 281). I would earnestly commend a careful consideration of this system, its working, and its results to all those who wish to master this most difficult part of the subject-matter of this report."

132. The gist of the above systems, especially the French, is as follows:—That agricultural and rural topics shall be dealt with in elementary schools, even to the youngest children, by means at first of object lessons, then of text-books and personal lessons with work and demonstration in the school garden or farm; that, in order to provide teachers for such schools, the normal school whether in France or Ireland is combined with an agricultural school and farm, where the teachers are more or less well trained in theoretical and practical agriculture. The education is provided for the children of peasant farmers, and their fathers are at the same time to be encouraged both to send their children to school and to develop their own practices, by prizes or honors for the best farm management, and by local societies.

133. It remains to consider whether some such scheme is not possible for this country. Such a scheme might be as follows:—the present district elementary normal school to have an agricultural side whether as part of it or as a supplementary *annexe*; the rural school-teachers to be trained in it not for one year (10 months) as now, but for 2 (or 3) years and to be attracted (1) by good stipends, (2) by comfortable lodgings, (3) by *assured* subsequent prospects; the work in the normal school to be actual manual labor on the farm, together with theoretical teaching and the regular literary training; the teachers, when trained, to return to their villages and be provided with proper school-buildings and a school-farm of about 5 or 6 acres, in which to teach the village school-boys. The village curriculum to be the usual literary training, only better because taught by better schoolmasters; school-books to be more adapted to the sons of cultivators, and to deal with the elements, the vegetation of the farm and garden including cereals, pulses, vegetables, fruits, grasses, fodders, seeds, trees, &c.; with soils; with the life of plants including their effect on the soil and their nutrition, the action of manures being thus brought in; with the animals and poultry of the farm; with its implements; and with the customs and habits of rural life in relation to health, cleanliness and decency, petty crimes; &c. These reading lessons to be accompanied by object lessons, partly in the school, partly in the garden; the elder classes to be practised in all farm and garden operations whether of ordinary cultivation or in the practices of good horticulture and the better known methods of dealing with fruit trees. The school-books to be really school-books and not elementary treatises on agriculture. The above scheme does not at all do away with the present system; it merely modifies it into direct relation with rural requirements; it is largely a development of the method of education by object lessons, it being believed that the mental faculties of children are better stimulated by observation and reasoning upon "concrete realities," than by mere mnemonical exercises; and it is intended at first, at all events, only for a *special set* of schools, such as could be officered by men who have had the requisite training at the normal school and who would probably not number more than 20 per annum per district. To encourage the teachers to undergo this training, their future must be assured; schools and stipends certain; preferential grants-in-aid given and special results grants for agricultural teaching, viz., small grants for mere passes in book work, larger ones to the master and good *prizes to the pupils* for satisfactory work by the pupils whether in the operations conducted before the Inspector, or in the appearance of school-plots worked by individual boys; *considerable results grants* for the school-farm, taking into consideration its general condition, its crops, stock, trees and hedges, treatment of manure with reference both to its manurial value and to sanitation, &c. Good prizes should also be given to be competed for by the various school-farms, the best-managed farms getting substantial sums. A village library, stud bull, &c., would complete the usefulness of the school-farm. The school-farm would be cultivated by the master and pupils, the disposal of the produce being arranged for by the schoolmaster with the parents of his pupils. Finally, it is to be noted that these schools, being purely rural and elementary and attended by the sons of ryots, in no way affect the ordinary town schools attended by boys who desire to proceed to secondary and the higher education, whether such be the ordinary literary education leading to the University, or any bifurcating scheme having a more purely practical standard.

134. The above proposals were made some time ago and have been considerably criticized. Hardly a single officer of those consulted objects to the principle that some sort of agricultural education is absolutely necessary. Apart from general statements that the scheme, as a whole, is for the present impracticable, specific objections are as follows:—

(1) The difficulty of getting practical Instructors at the Normal School who will work with their hands as well as with their tongues;
(2) The doubt whether two years is long enough for Normal students;
(3) The doubt whether students will work with their hands;
(4) The doubt whether trained students will carry into their villages what they have learnt at the Normal School;
(5) The initial expenses of the Normal School-farm;

(6) The necessity for hired labour on it;
(7) The initial expense of School-farms;
(8) The doubt whether parents will send their boys, as they will prefer to make them work at home, if they are to work, and many will object to their working at all;
(9) The doubt whether the School-farm could be made to pay, so that the example would be mischievous instead of beneficial;
(10) That the plan proposed is an attempt to force upon the ryots an article, viz., an agricultural education, for which there is no demand;
(11) That spade tillage which would be practised is not useful as a practicable measure; that it would be difficult to exhibit a good manurial practice; and that there is no scope for showing the value of fodder-growth on so small a farm;
(12) That text-books dealing with (*a*) the principles, and (*b*) the faults of practice should be written by experts, and the former made compulsory in schools in addition to the ordinary curriculum;
(13) That as the village schoolmaster is unable even to teach ordinary object lessons, the attempt would be only to induce greater "book-cram" and add to the present failure in science or technical teaching;
(14) That to abandon general education in all elementary schools in favour of special agricultural education, would be a grave error; what is wanted is education that will develop every class;
(15) That the scheme, if tried tentatively and locally, might succeed but only if continuous personal influence were brought to bear;
(16) That it should be left to District Boards to decide whether to introduce such a scheme, which should not perforce be introduced as an essential part of the educational scheme.

135. No one doubts but that it is impossible to start at once such a scheme as a fully developed system, complete and finished to the last polish, or that it should be a universal scheme, substituted for old ones, and universally and instantly applicable. All that has been suggested is that, in certain localities where it may be or have been considered desirable, the authorities might have power to introduce such a scheme for a certain number of schools, the necessary alterations being made as enabling clauses in the Grant-in-Aid Code, in the standards, and in the methods of training all or most of the Normal school *alumni*. It is to be remembered that these men, even under the present system, are but few amongst the crowd of rural schoolmasters, and that simply to train these men in a better way is not therefore to upset the present system. But considering the small amount available for primary education, it is a question whether the whole amount available should not be spent in training and paying a proper class of teachers, without whom real teaching is impossible, and village education a sham. The idea is to thoroughly train a body of rural schoolmasters who shall be able to teach the ryots' sons, even from an early age, and in the most attractive and stimulating way, by means of and in the objects of daily life, and in the principles and consequently practice of a developing and progressive agriculture and rural economy.

136. There is a very marked dissatisfaction amongst many officers, including, notably, various Inspectors and Deputy Inspectors of Schools, with the matter and manner of the present elementary instruction; it is felt that better teachers, capable of teaching more useful knowledge in a better way to pupils who would in that case be more largely attracted, interested and developed, are greatly wanting; that school-books are defective, method insufficiently taught, the general standard of Normal school work far too low. The object of the present proposals is merely to secure that better matter and manner, so that the growing and succeeding generations of ryots may gradually be more and more interested in and developed by an education which is in direct relation with the aims, objects, difficulties and facts of their every-day life. Such change must necessarily be gradual and tentative, and this answers those objectors who urge that the scheme is, at present, impracticable; it is so at once and as a whole, but this is no reason against its being set on foot, if it be found a desirable scheme. All that is necessary is, if and where it is considered desirable, to begin at it; it is not a sound objection that it is not as yet practicable as a whole.

137. Taking the specific objections; the first is that practical agricultural instructors for Normal schools, who will work with their hands, are not available. This has always been admitted as a difficulty, though Mr. Keess believes that he can put his hand on half a dozen such men at once. Be this as it may, the difficulty is not insuperable. In previous paragraphs of this Note, it has been pointed out that the Saidápet College students had not any practical training; they were bookmen and little more. But the reasons for this were also pointed out, viz., that the college was a mere isolated fact, wrongly recruited, teaching theory and high science to men who knew nothing of the art to begin with, and who never had any opportunity of practical work afterwards; there are no scientific private farms, no Government farms, not even a definite future for the graduates. It was also suggested that a rightly framed department should, by establishing district farms, train up lads in practical work and send the best of them to Saidápet; that the best of these graduates should there labour at first as overseers and finally as superintendents on district farms developed originally from purely native methods and therefore fully cognizant of actual native practice. Such a scheme would soon provide properly trained men for Normal school farms. As for their not working with their hands, they would do this when they know how—*i.e.*, after a practical training—if their pay depended on it; it is common experience, as pointed out by some officers, that even the highest castes will do any work not actually degrading, provided they are paid; witness the officers of the Stock Department, or of fish-curing yards, or the employés of abkári renters.

138. The next doubt is whether two years is long enough to train students in the Normal school; two years is insufficient, it is said, either to train a student properly in agriculture, or to train him properly in mere general knowledge and methods of teaching. This is a valid objection, the curious thing being, however, that one year (ten months) is now considered sufficient for training a rural teacher. In Germany, especially in Saxony, six years is the training time, though the students enter with a better initial education than that with which the South Indian trained teacher leaves the Normal school; 3 years in a preparatory college and 3 years in a training college, or 6 years under one roof, are the German essentials; these men teach the veriest village schools, content so long as they are assured of a livelihood and of promotion according to ability. The more backward the country, the greater the reason for *good* teachers; hence the backwardness of South India is not a reason for training its teachers worse. Probably 3 years would be found practicable, it being remembered that high science in agriculture is not required, but only the principles and practice of sound and improved agriculture.

139. That such men will work with their hands is hardly doubtful; they are not generally of a class above the ryots and it is simply a question of money. Moreover, the out-door toil is rather a recreation than otherwise, and the morning's work in the field or garden will not be distasteful.

140. Whether they will carry the knowledge into practice in the villages is another doubt. The reason for the doubt is not quite clear, as the subject is not less, but more in harmony with the ryots' needs than mere literary education. Besides, the proposals already made for extra results grants and prizes for class work, garden, field or farm results, will go far to encourage the men. In this, as in other cases, it will be remembered that a district association with village branches, especially in the places where these schools will be placed, is assumed (paragraph 122 *supra*).

141. The initial expenses of Normal school and village school farms may be considerable; the former, however, is but one per district and a few thousand rupees is not an insuperable difficulty; nor is that of a few village school farms. If the plan, however, is desirable, the expense must be faced. Possibly, also, it may be necessary to have a little labour on Normal school farms, though probably not much, as the vacation is usually in the hot weather when farming operations are few. Moreover, if the plan of having good lodgings for students and their families is adopted, there is no special reason why they should all leave for the vacations.

142. There is little doubt but that parents will send their children if proper inducements are held out, such as (1) good education in the knowledge they desire;

(2) prizes for the boys; (3) permission to enjoy the produce of *garden plots*; (4) reduced fees. Village schools, it must be remembered, contain ryots' children; many of them are got up by the chief men of the village to educate their children, especially those who are to become village officers. These children have no objection to work, and in fact one objection to the schools has been that children will be wanted by their parents to work in their own fields. The above inducements, coupled with the proposal to make agricultural education part of the new test for village officers, would probably get over the difficulty if it exists. As regards the objection that ryots do not want their sons educated, it is replied, (*a*) that hitherto the education has had little to do with a ryot's life, and has only been useful for those who were to be village officers, or who possibly might go on to a higher school, whereas the new curriculum would be attractive; (*b*) that the school-period might be arranged to suit those whose children are busy for part of the year; (*c*) that as a matter of fact many children do attend schools of one sort or other, whether inspected or non-inspected, and that the school-fees and presents in non-inspected schools are very considerable, probably averaging Rs. 3 or 4 per year per child. The objection exists in all countries, but is not a practical difficulty even in the lands of peasant proprietors, who, in Germany and Switzerland, do not dream of keeping their children from school. It may, moreover, be remembered that such subjects are always found to be *rest* or recreation subjects, that it is a relief from book-work, and those who have seen a score of village lads, who ought to be in the open air, crowded in a shed from 6 A.M. to 6 P.M., with only a break at midday, yawning, cramped, miserable with the monotony and dulness of rote-repetition of uninteresting and often unexplained book-work, will not doubt that lads will gladly take to open air work as a relief. It is found in continental schools that lads working half-time at manual labour and half at book-work, are not behind other lads who work at books only.

143. Whether the school-farm will pay is another doubt. Remembering that the schoolmaster is himself of the village class, that his friends and relations are probably cultivators, that his pupils are also of that class, there can be little doubt but that it will well pay its expenses; it is not like a mere bookman going to farm for the first time and lavishing capital on which he requires a return. The schoolmaster also will have plenty of leisure for work. Moreover, as a man of the village, the ryots will perfectly understand that the farm is more a demonstration farm and depôt than a means of livelihood; it is not like a great Government Farm which may be separate from them in practice. The farm is not an example farm or a place for teaching agriculture, so much as a school demonstration farm, a "Kindergarten" in actual fact, where object lessons can be given of the most useful sort, and where the lessons of the school-room will be exemplified.

144. The objection that it is an attempt to force an article on the ryots that they do not want is not clear; if valid, it would also be an argument for not introducing any measure of progress. Surely it is for those who see the need for education and for the development of agriculture, to look further ahead than the ryot of the day, and to consider not merely what he is but what he ought to be, not merely what he wants but what he ought to want.

145. Spade tillage must, if population increases without positive check, be a necessity of the future, but it is not a *sine quâ non* even of school farms; its possibility and its results were to be shown. It may be noted that the Glasnevin 6-acre farm has no working cattle. That farm also exemplifies the proper feeding of cattle including the growth of grass for them.

146. Text-books are of course necessary, but will not be very useful without demonstration. With such demonstration the objection that there would be more "book-cram" disappears. The essence of the scheme is object lessons by well-trained teachers; the *thorough* training of the teachers is a *sine quâ non*. A treatise for ryots' reading, and still better, a periodical publication, are of course *desiderata*, for the proper use of which they would be prepared by the schools.

147. The other objections have already been dealt with by anticipation; the exact details or measure of success cannot be foreshadowed, but the problem, like many others, *solvetur ambulando*. It is not pretended that rural education is a complete

panacea; it is only one of many means, and is at least feasible to a large extent, and is not to be rejected because it is not perfect in itself or a complete remedy. The chief reason for adopting it is that of developing the ryot by a true education; the instrument, viz., the village school-master, is a man in contact with the ryot, more or less trained to impart instruction, and may be still better trained with that end.

148. It may be well to refer to the expressions of Government on this same subject, viz., the provision for agricultural education in elementary rural schools. In 1876, it was declared that "Government are willing to encourage, in every way, the acquirement by school-masters of a fair knowledge of practical agriculture to enable them to make elementary agricultural instruction a part of the curriculum in all elementary rural schools," and it was regretted that there had been delay in inaugurating a system of instruction in agriculture. The Government method however was obviously insufficient, since it merely approved of proposals to allow teachers of the Madras Normal school to attend a few lectures at Saidápet. Accordingly, the Director of Public Instruction at once pointed out that such teachers were University graduates or under-graduates and were not intended for elementary but for High, Middle, and Normal schools; that they attended the Normal schools for only a few months and could get but a very slight and superficial knowledge of agriculture by attending a few lectures. He went on to say that in the elementary Normal schools then being established in each district, an elementary course of agriculture might form part of the curriculum; and that to induce men trained in those Normal schools to teach agriculture, the Grant-in-Aid Code would provide results grants. Practically, nothing has been done on these lines; elementary agriculture is not a compulsory subject in Primary Normal schools, and is only an optional subject in the fourth and higher standards; there is no one to teach it and no proper class-book; the chief objection, however, is that *very few* ryots' sons ever reach the 4th standard.

G.O., dated 18th May 1876, No. 642, Revenue.

149. The Director alluded to the Glasnevin (Dublin) training in agriculture for Normal school students; these men, like those on the Continent, are intended for rural elementary schools, and correspond to a great extent, in status, with those trained in the Primary Normal schools of this presidency, though their attainments are higher. The following extracts, from the evidence, &c., given before the recent Departmental Commission on Agricultural Schools, refer to Glasnevin:—

"Glasnevin farm was originally established for the purpose of giving national school teachers a knowledge of agriculture, as it was considered in the system of national education in Ireland that agricultural instruction should form part of the subjects taught, and, in 1838, the Commissioners took this farm at Glasnevin, for the purpose of giving the teachers practical instruction on the farm. I should think about quite 2,000 young men have passed through the Glasnevin school, and teachers who have been trained under the Commissioners of national education in their training establishment have also had some training on the Glasnevin farm. They come out two days a week for two hours each day. They receive lectures at Glasnevin on two days a week, and they walk over the farm and see operations of the farm for about another hour."

It will be seen that this training is comparatively poor; a certain number of lectures during 10 months, with walks round the farm, are poor substitutes for actual work on the farm, where the students put into actual practice the lessons they have studied in the school. The Superintendent has personally stated that the training is not sufficiently practical, and that his own object is to get the students to live on the farm itself and work there; nevertheless, he is personally aware of improvements that have been introduced into agriculture by means of these men, and considers that they are capable of doing good service; *à fortiori* properly trained men would be still more useful. The Secretary to the Council of National Education also considers the training to be not sufficiently practical: Dr. Sullivan would even make Glasnevin an Agricultural Normal school, solely for thoroughly training rural school teachers in theory and practice. In addition to these men trained at the Normal school, who number about 100 per annum, there

are thousands of teachers who study agriculture merely from a text-book; some few of them come up during vacation time for a special 6 weeks' course at Glasnevin.

But whether trained at Glasnevin or not, all elementary school teachers in Ireland *must* pass an examination in the theory of agriculture; otherwise, they are not recognized for "classification" by the council. As for the school-boys, the study of agriculture is compulsory in all rural national schools in the 4th and higher standards, and Mr. Carroll, the Superintendent of Glasnevin and Inspector of Agricultural Education, considers that such teaching, even by mere text-book teachers, is of some benefit, as the boys learn practice on their fathers' farms and principles at school; the results, however, of teaching by teachers trained at Glasnevin is, in his opinion, much superior, and the boys pass a better examination. It will be noticed that 44,000 boys passed in agriculture in 1886. As noted below, Professor Tanner is aware of many instances in which "school-instruction has led to very active discussions at home, and that whenever agricultural instruction was given, the parents at home were about as anxious as the children to know what had been taught, and the why and the wherefore of the matters included in the day's instruction." Similar testimony on another occasion was given by Professor Baldwin regarding agricultural instruction; it will be remembered that all these statements refer to Ireland and to the lakhs of petty tenant farmers holding not above 6 acres of land. Writing of the United Kingdom generally, Mr. Jenkins, whose report was adopted by the Royal Commission on Technical Instruction, was of opinion that the agricultural class teacher as a rule could not teach objective agriculture, having merely learnt the words of agricultural language, but being incapable of translating them into fact on a farm. This was due to the want of proper training, which could not be complete till it included "a regular course of practical work on a farm," for which no provision had been made.

150. On the subject of agricultural instruction in primary rural schools, the following is of interest. In Ireland, besides the schools in which agriculture is taught merely from a text-book,—whether by men trained at Glasnevin or not,—there are 56 rural schools, to each of which a small farm is attached, and 27, each having a school garden. On them Mr. Carroll, the Superintendent of Glasnevin and Inspector of Agricultural Education, gave evidence * as follows :—

* Before the Departmental Commission on Agricultural Schools (1887).

Are there any agricultural schools besides those situated in different parts of Ireland?—There are at the present time 56 what are called ordinary agricultural schools. These are taught by the teachers of the schools altogether on their own account, who are paid results fees under three heads, (A) Theory, (B) Practical Agriculture, (C) Management of Farms.

Are they attached to the elementary schools?—Yes; they are attached to the elementary schools.

And to whom does the land belong?—The land is generally rented by the teacher and farmed entirely at his risk and expense.

What is the acreage of the land so attached?—The minimum acreage is three acres. A farm will not be taken on the list if it has not three acres, and they go up to about 25 or 30 acres.

Have you any experience of the success or otherwise of these schools?—I have to examine the boys of those schools each year.

Do you go yourself and visit them?—Yes.

In what condition as to agriculture do you find these small farms attached to the schools?—I am rather sorry to say that I felt constrained to reduce the department very considerably since I became inspector of those schools. I had a good many of them struck off believing that they were not doing the work that they ought to do. I believe that has had a good effect on those that remain, and I believe the 56 that we now have are doing fairly good work. They are not expensive, and I believe they are doing good work, and I should hope that there will be some further improvement in them, and also an increase in their number.

Now at those schools is the labor of the boys available for the work of the farm?—When those schools were first established the idea was that there should be what is called an industrial class in the school. I think that took place in the year 1846. There was a number of schools where these industrial classes were taught, but the idea was to improve education, and what was known as the result system was introduced. The teachers finding that they could not pay that attention to the farms that was required, and the parents of the pupils did not appear to wish that their children should work so much on the farms, and I may say that the working of the boys on the farms is now practically given up.

And the teachers had to employ their own or other labor on the farms in order to keep them going ?—Quite so.

Who pays rent for these farms ?—The teachers. The teachers pay rent, pay labor, pay all expenses and they make what they can of the produce of the farm.

The teachers have fees, I understand, paid to them by the report of the agricultural inspector ?—Yes.

Which fees are conditional on the farm attached to the school being in a good state of management ?—Conditional upon the farm being in a good state, and also conditional upon the pupils having passed a good examination with the literary inspector in the text-book of the subject.

Are there other schools with land attached in similar manner as gardens ?—Yes, there are 27 schools that have gardens attached. Those are what are called schools gardens schools.

How do these work ?—Well those I believe are calculated to do a great deal of good in the country. Ireland up to the present has not gone in for the cultivation of vegetables, and in fact I know of several districts where crops have been introduced through means of these schools.

In those schools do the boys work in the garden ?—In some of them. The work is done principally by the pupils.

But are the gardens used to demonstrate to them anything connected with the fruit and vegetable growing ?—The teacher is expected to give half an hour's instruction each day on the cropping of the garden and farm, he may give more, but he is expected to give at least half an hour's instruction each school day on the general management, crop and stock of the farm and of the garden.

In your opinion is the system of the garden schools so beneficial that you would propose to introduce it ?—I shall like to see it extended very much. The expense is very little indeed, and I feel perfectly satisfied that it would be a very great matter of importance if it were extended not alone in the growing of the crops of the garden, but also in giving habits of neatness and order and taste for good cultivation that such a thing would show."

It will be seen that this opinion is not altogether favorable to the school farm proposals; though Mr. Carroll is fairly satisfied with the working of the school farms, it does not appear that it is the pupils who cultivate the farms. On the other hand, school-gardens are thoroughly approved. It is however to be remarked (1) that the Irish school-teacher is not so much a part of the village system as in South India, where the schoolmaster is probably a village resident with relations as land-holders; (2) that the masters themselves are *not* practical agriculturists except in so far as the above mentioned insufficiently practical training at Glasnevin is concerned; they have never been taught to work personally on the farms; (3) that the prize system for pupils, and plots for pupil cultivation on the plan worked by Mr. Newlyn at Sherborne, is not in vogue; (4) the prize farm system is not in operation to stimulate the masters; results grants are however obtainable for good farm management; (5) the agricultural instruction and examination were chiefly based on the text-book, and the literary education was considered more important and more paying than that on the agricultural side; hence the natural neglect of the latter. But even if the farms do not fully pay, they appear to be most useful; otherwise, Mr. Carroll would have abolished them as he did the others.

151. The evidence of Professor Tanner of South Kensington may be usefully quoted :—

"2536. You are of opinion that it would be well in rural districts if agriculture should be more uniformly taught in the elementary schools ?—I think so, Sir, and I believe it would be attended with many and great advantages. I have found by occasional visits to schools—strictly unofficial visits—that where this subject has been taken up, it has been one which has been quite a *rest* subject in the school; it is not one which seems to be looked upon as an additional burthen to the scholars and, largely, because it is, of all the subjects taught in elementary schools, the only one on which the children can talk with their parents at home, and on which they get up their little discussions, and I have met with many instances, in which the instruction in the school has led to very active discussions at home, and that whenever the agricultural instruction was given, the parents at home were about as anxious as the children to know what had been taught, and the why and the wherefore of the matters included in the day's instruction.

* * * *

"2538. And you should like to see something of the same sort * with regard to agriculture ?—I should, Sir; but the great point in connection with the regulation is that it involves certain work done with their own hands, and the reports made by the inspector—the last report—is in the highest degree encouraging.

* Relates to a practical cookery and dairy class for girls.

"2539. Do you think it would be advisable with regard to elementary schools, where it would be practicable so to do, to attach plots of land or school ground, so that something practical with regard to the rudiments of agriculture might be taught as well as the theoretical rudiments?—I think, Sir, there are many cases in which these additional plots of land would be extremely valuable, but really the practical advantages resulting from it would depend as much on the teacher of that school as anything else. In the hands of some men, it would be a valuable agency. In the case of others, I think that it would be of very little use, but just in proportion as teachers are rendered more competent for teaching the subject of the principles of agriculture, so they would also be more likely to make good use of small experimental grounds such as you have referred to."

Professor Wrightson was also of opinion that "it would be of very great value to make agriculture a subject, and a compulsory subject, at rural national schools, as they have done in Ireland. At all their national schools in Ireland, they teach agriculture, and they ought to do it in England." He was of opinion that properly-guided rural schoolmasters could teach young children the principles of elementary agricultural science.

152. Similarly Colonel Donnelly writes as follows:—

"The farm labourer or the small farmer cannot afford to go himself, or send his son, to an institution the attendance at which entails boarding out. The instruction in scientific principles must therefore be given in the elementary schools. The instruction in the elementary school might be rendered more directly useful to those engaged in agriculture in this way,—one of the class subjects under the code is 'elementary science,' which provides for a progressive course of simple lessons on various topics, among which are specified animals or plants with particular reference to agriculture, mechanical appliances, &c., to cultivate habits of exact observation, statement and reasoning. It is worth consideration whether, under some similar arrangement, school gardens might not be provided for practical instruction in some branches of agriculture as suggested by Professor Tanner. The difficulty that meets us, both with regard to the instruction in the elementary schools and in the science classes, is to find efficient teachers. As regards the former, it will be seen, from the memorandum which I furnished, that the number of training colleges in which the principles of agriculture are taught, and the number of pupils under instruction, is increasing rapidly; and it is to be hoped that the instruction in this and the other branches of science taught in training colleges may be stimulated and improved. All this must, however, be a matter of time."

153. The Royal Commission on Technical Instruction wrote as follows regarding the proposals of Mr. Jenkins, their Assistant Commissioner, whose report they practically adopted in its entirety:—

"His recommendations in reference to elementary schools in rural districts are more definite. We agree with him in thinking that instruction in the theory and practice of agriculture should, in Great Britain, as it already does in Ireland, after suitable introductory object lessons, form, in the upper standards, a part of the ordinary elementary subjects of rural schools, and should not be relegated to 'class * subjects;' and that, if time cannot otherwise be found for them, which we scarcely anticipate, some of the elementary subjects, such as the higher branches of arithmetic, should be transferred from the former to the latter category; and, further that encouragement should be given, by way of grants, to practical work on plots of land attached to such schools. One good result of this would probably be that the children, taking a more intelligent interest in farm work, would be less anxious to migrate from the country into the larger towns. It is probable that, if a demand existed for a practical knowledge of agriculture on the part of teachers in rural schools, some of the farmers' sons, who at present unhealthily increase the competition for farms, would qualify themselves to become elementary teachers.

* Optional or extra subjects, apparently.

"The subject of agricultural education, which is of national interest in Great Britain, is a question of life and death for Ireland; we are happy to find that this is thoroughly felt both by the Government and by the people. There is progress in all directions * * *. Every elementary teacher in Ireland is required to pass an examination in agriculture, and the science and practice of agriculture are taught to all boys in the three upper standards (or classes, as they are called in Ireland) of all rural schools. Last year nearly 45,000 boys were examined in this subject. Small farms are attached to some of these schools, and special grants are made for proficiency in practical agriculture, as tested on those farms. What is most encouraging is, that the authorities of the National Board themselves are not satisfied with what is being done. They are anxious that more encouragement should be given to the patrons of schools to furnish them with small example farms; they admit that when this is done, results cannot be effectively gauged by their single Agricultural Inspector, Mr. Carroll, in addition to his duties as head of the Glasnevin Institution."

154. Mr. Jenkins bases his recommendations on the belief "that the discipline and cultivation of the mental faculties can be obtained through the medium of useful

knowledge bearing upon the pursuits of after-life as well as through the medium of other subjects which, although of the utmost practical value to persons in some other walks of life, are of no value to the children of farm labourers and are learnt at school to be forgotten as soon as possible afterwards. I believe also that the adoption of such a scheme of elementary education as I have suggested, especially in the case of boys, would, as already hinted, remove much of the hostility which farmers now have to the 'Elementary Education Act' of 1870." He believed that what a child sees around him is the proper basis of his education which should refer to the objects of everyday life and duty, so that boys would be educated with a view to their remaining peasants, and not, "as farmers complain they are at present, as if with the express purpose of unfitting them for an agricultural career."

155. Mr. Jenkins further writes as follows :—

"'In connection with Mr. Bailey Denton's reference to the desirability of a piece of garden ground being attached to the school, I will quote from Mr. T. Wilkinson's pamphlet, entitled 'The School Garden; a means of technical education for the farm labourer,' merely premising that the author is an Associate of King's College, London, and Head Master of the Harrow Board schools, and therefore presumably acquainted with the educational as well as the scientific aspect of the question. Mr. Wilkinson says :—

"'Each school in a rural district should have, as conveniently accessible as possible, a piece of land large enough to allow every boy over a certain age or standard (say 10 and standard III) a plot from five to eight poles in extent. The size of each plot would, of course, depend upon the area at disposal, and also upon the staple and quality of the soil, and the physical ability, intelligence, and industry of the tenant.

"'Each plot should be cultivated by the boy holding it under the superintendence of the schoolmaster, who might reasonably be expected to possess the moderate amount of knowledge on the subject necessary to obtain a certificate from the Science and Art Department. Where such an arrangement is impossible, or inconvenient in the case of the master, an intelligent gardener living in the neighbourhood might be engaged for a few hours weekly.'

"'Mr. Wilkinson further suggests a modification of the code as regards class subjects, as follows :—

"'The subjects usually chosen are grammar and geography. I would substitute for these agriculture in two parts, dividing the grant (four shillings) equally between the theoretical teaching from the class-books and the practical application of the subject-matter in the school garden. This need not necessitate the abandonment of the subjects mentioned as commonly chosen. Geography could be taken as a reading lesson, and grammar as part of the reading and dictation lessons. However this might be, it appears to me that the grant to rural schools would be more wisely and profitably expended by encouraging the teaching of agriculture. The plan advocated would not, therefore, involve additional expenditure on the part of the Government.

"'The expense to the school funds, after the first necessary outlay for fencing, drainage, &c., need not be considerable. An acre of land, containing 32 plots of 5 poles, or 20 plots of 8 poles each, would be sufficient for ordinary schools, as by the conditions suggested not more than 20 to 25 per cent. of the boys would be eligible as tenants. It might be anticipated, however, that the education provided would induce parents to keep their children longer at school.'

"Mr. Wilkinson's suggestion differs from the French system in two important respects, viz. :—(1) that in the latter the children of from seven to nine years of age are taught practical agriculture in the school garden as a beginning of their technical instruction; and (2) that the school garden is cultivated as a whole by the school, nominally by the schoolmaster, but actually and under his instructions by the pupils. I must confess that I prefer the second part of the French plan as a means of instruction, but I would have a reserve of land to be allotted to the older pupils as a reward for progress, and I would give prizes every year for the best managed plots."

He also bears witness to the fact that "both pupils and teachers look upon lessons in agriculture as a recreation rather than a task."

156. Finally it remains to notice the recommendations of the Departmental Commission on Agricultural and Dairy schools. In their first report, they remarked as follows :—

"We are strongly of opinion that increased facilities should be given for the study of the principles of agriculture in rural elementary schools and that gardens, allotments and farms in connection with them should be encouraged.

"And that further inducements should be offered to teachers to improve their qualifications to give instruction in agriculture.

"With this object, we consider it advisable that opportunities for some study of practical agriculture should be afforded to all teachers of agriculture either at the Central Normal school, or at district, middle class, or other schools where practical agriculture would be taught."

In their final report, the following remarks occur :—

"We now deal with the teaching of the rudiments of agriculture in rural elementary schools. The present revised Code presents an admirable syllabus of elementary science, well adapted to instruct the children of agricultural laborers in matters of every-day experience and to induce habits of intelligent observation in reference to growth of crops, effect of manures, and other details of agricultural practice. This, however, is a 'class-subject,' which is only permissible as a second subject after 'English' has been taken up.

Viz., the classification of agriculture as a "class-subject" only to be taken up *after* the vernacular.

"The reasons for this are stated by Mr. Cumin to be that—

"1. In every system of education, now in existence, the language of the country is the first thing which a child ought to know and ought to be instructed in.

"2. English, when it was optional, always was the favorite subject.

"3. English is a subject which all teachers can teach.

"4. A considerable saving in inspection is effected under the present system.

"We desire to suggest that it would be of great advantage to have special peripatetic instructors to meet the deficiency of technical knowledge on the part of certain rural schools, and further that, in rural schools, far larger opportunities should be afforded for teaching agriculture, or rather elementary science in connection with agriculture, and that it should be optional to take the 'class-subject' of elementary science before that of 'English.'

"The recommendation of the Royal Commission on Technical Instruction, 1884, that 'in rural schools instruction in the principles and facts of agriculture, after suitable introductory object lessons, should be made obligatory in the upper standards,' does not appear to have been carried out.

"It is obvious that the teaching of elementary science to an extent sufficient to enable an agricultural laborer to take an intelligent interest in his daily work could not fail to be of distinct advantage.

"Some interesting information was further afforded by Mr. Cumin to the effect that, previous to the introduction of the revised Code, grants were made, viz., in 1846, by which fields or gardens might be hired, grants obtained for half the rent, for purchase of tools, and for gratuity for teachers when instruction was successful. These grants, says Mr. Cumin, were practically abolished by the revised Code and everything was reduced to payments for the elementary subjects.

"In view of the evidence given before us by Mr. Newlyn of the successful working of allotments in connection with an elementary school at Sherborne, we think it would be advantageous to the children of agricultural laborers that, where practicable, this system should be encouraged by the introduction of a system of grants similar to those now made for teaching cookery."

They then proceed to deal with the teachers required for such schools, remarking on the insufficiency and even mischievousness of existing teachers *only trained in text-books without any practical course*, so that as Professor Wrightson says, "old-fashioned ideas, fundamental errors, want of sound knowledge, and slavish adherence to text-books" are the result. Even teachers trained at the normal schools (English, not Irish), who since 1882 have been studying, as future teachers of elementary schools, to acquire some knowledge of the principles of agriculture, are absolutely devoid of any practical training and are therefore comparatively inefficient. What is wanted in a teacher is that he shall be "not only competent to teach the principles of agriculture, but also conversant with its practice, so that he knows and understands the actual and substantial difficulties with which the ordinary farmer has to contend and is able to make practical suggestions, such as the farmer could put into practice without difficulty."

157. Such are the latest views regarding education in agriculture in primary schools, and it will be observed that it is not for the children of enlightened and educated men that this is proposed, but for the sons of poor Irish tenant farmers, occupying not more than six acres a-piece, or of English laborers and petty tenant farmers, of whom the former class are probably more ignorant, more hopelessly mere "farm implements" than the bulk of South Indian ryots, who however wedded to custom and however ignorant, are men owning the lands they till, independent of mere wages and a wage-payer or the fear of competition rents, and able therefore to adopt and enjoy the fruits of any demonstrated improvement, or of any profit which their minds, *when enlightened*, can produce for them. It is ignorance that begets slavish adherence to custom; ignorance, that is, of possibilities, and of the facts and results in other countries, ignorance of changed conditions, ignorance of methods available to meet those conditions. As recently observed by the Minister of Agriculture for France "ignorance and routine (custom) are the curse of French farming," and his great

remedy, though an agriculturist, for these evils, was an enlightenment of the French ryot in all matters pertaining to his every-day life by means of elementary education. Finally, it is to be remembered, whether in dealing with education or with other proposed improvements, that Indian ryots are not to be classed *en masse* as hopelessly careless of improvement or of advance in knowledge, or as paupers "struggling with chronic poverty;" millions may be so, but millions more are intelligent in their own art, willing to send their sons to a proper school, ready to adopt and pay for a clearly demonstrated improvement; it is with this latter class that the department would primarily concern itself and would find therein an ample field of operation and much reward for their labor.

158. The next consideration is that of special agricultural education, an entirely different question: the primary education including that of the teachers who are to officer the rural schools should be complete in itself for the class of ryots who are and who intend to remain ordinary ryots: the higher is for classes (*a*) such as the bigger ryots who, while owning lands, do not personally cultivate them, but merely oversee operations in general, or (*b*) who desire a general knowledge of agriculture for use in their subsequent professions, or (*c*) who intend to enter Government Service, either in the Agricultural, Revenue, Forest or higher educational branches. The special education may be either secondary or higher; the former is that which may be taught in the Middle and High Schools of the country; the latter, that which is given in special institutions intended to turn out graduates of considerable scientific and practical attainments.

159. *Agricultural Education in High and Middle Schools.*—In paragraphs 17 and 18 *supra*, some account has been given of the attempt to give agricultural instruction in High and Middle Schools in immediate conjunction with farms; the farms were to be partly experimental, partly educational.

It will now be well to give a somewhat fuller account of the scheme. In 1878, the Board were "strongly of opinion that the main way to make a real impression on the agriculture of the country is steadily to continue and *extend* a sound system of scientific agricultural instruction such as has been lately established at the Government Agricultural School, Saidápet. If the Board's recommendation to put this institution on a firm and stable basis and to start smaller educational farms with trained Superintendents for the systematic diffusion of agricultural education in several districts is resolutely adopted and carried out for some years, they are confident that the best results may be anticipated when sufficient time has elapsed for them to show themselves." Steps *must* be taken, they considered, to educate as large a proportion as possible of the agricultural youth of the country. Government approved of this opinion and then followed the proposals mentioned in paragraph 18 *supra*. The details of the scheme sanctioned by Government (paragraph 18 *ad finem*) will now be given, but it must not be forgotten that much stress was laid by the proposers of the scheme, Messrs. Macdonald and Benson, upon the association with the schools of a small farm, especially as one object of the High School instruction in agriculture was the supply of practically trained lads to the Saidápet College. Moreover, since it was not intended to give any special hopes of Government service to trained students, it was obviously more important than ever to give them a practical training, so that they might be in a position to utilize their special education to their own advantage in farming. Mere agricultural training by means of a text-book without any farm demonstration would, it was thought, lead to mere "book-cram," and would turn out neither scientifically trained men nor farmers.

Board's Proceedings, No. 2112, dated 31st July 1878.

Papers in Board's Proceedings, No. 1780, dated 23rd November 1880.

160. The Director (Col. Macdonald) wrote as follows:—

"2. In Bombay the programme of studies for the agricultural classes attached to the High Schools extends over two years. The first year is devoted to Chemistry, Huxley's Introductory Science Primer, 105 pages of Balfour Stewart's Physics Primer, and Tanner's Agriculture. The second year's course includes Roscoe's Chemistry Primer, the whole of Balfour Stewart's Physics Primer, Wrightson's Agriculture, Hooker's Botany Primer with Johnston's Botanical Diagrams, Geikie's Physical Geography Primer and Geikie's Geology Primer. Students may also obtain

certificates in Land Surveying, Drawing, Physiology, and a more extensive course of Botany; but the study of these subjects is not compulsory. Students entering the agricultural classes must be learning a High School standard, *i.e.*, Standards IV, V, VI and VII. These standards correspond in a general way with our Lower and Upper Fourth, Fifth and Sixth classes. Boys taking up the Agricultural course are excused the classical language and after obtaining a first-class Public Service Certificate, they are also excused History and Geography lessons. Revenue officers are invited in filling up appointments, to give a preference to boys holding the second year High School Agricultural Certificate, and boys who pass are also eligible for admission to the Civil Engineering College in the Lower or Non-University class. It is perhaps owing to these inducements that the classes are well filled, although the course is an optional one. The annual examination is entrusted to the Principal of the Civil Engineering College. To each school a small piece of land (6 acres) is attached for practical instruction, with an initial expenditure of Rs. 70 per acre for stocking, &c., and an annual expenditure of Rs. 60 per acre for working expenses. In some of the schools there is a Committee with the Head Master as Secretary for the management of the land.

"3. Mr. Benson proposes a two years' course, but it is to be confined to agriculture, the text-book in the first year being Robertson's Agricultural Class Book, and in the second year Wrightson's Agriculture with the Saidápet Farm Manual. Two hours per week are considered sufficient for in-door instruction, in addition to which there are to be field classes of an hour each twice a week for those who wish to attend. Mr. Benson proposes that the study of agriculture shall be made compulsory in the Upper Fourth and Fifth classes and perhaps in the Sixth class, and that promotion in the school shall be as dependent on passing in agriculture as in the other subjects taught. Mr. Benson suggests that there should be two examinations corresponding with the first and second stage of the Science and Art Department, South Kensington. Boys who have been admitted into the Matriculation class after passing the higher examination in agriculture should be eligible for admission without further examination into the School of Agriculture and a scholarship, tenable for two years in the School of Agriculture and increasing in amount as the student advances in his studies, is to be awarded in each school to the pupil, who, after passing the Matriculation examination, shows the greatest proficiency in practical agriculture. If the instruction is optional, Mr. Benson thinks that the subject must be taught out of school hours, and the inducement to take up the course must take the form of some advantage as regards admission into the Revenue Department. He accordingly suggests that in that case agriculture shall be made a compulsory subject in the Middle School examination for all persons wishing to enter the Revenue Department, and that a higher examination in agriculture shall be added to the special tests for the Revenue Branch.

* * * * * *

"5. As in Bombay it will be necessary to sacrifice some portion of the general curriculum in the case of agricultural students. The History of England may be given up and such portion of the Sanskrit or Vernacular course as is not essential for the Matriculation Examination.

"6. The agricultural classes will not be filled unless some inducement is held out to the pupils. The first inducement which I propose is a slight reduction in the scale of school-fees. Probably it would be sufficient if the fees were reduced to the rates prescribed for Aided schools.

"7. I am inclined to think that two scholarships should be given to the two best pupils of each school on the result of the final examination, the scholarships to be tenable for two years in the School of Agriculture and the student being exempted from the first year's or preparatory course of the School of Agriculture.

"8. The second examination in agriculture should, I think, be made one of the special tests for the Revenue Department from some prospective date. The proposal has been already negatived, but it appears to me almost essential to the success of the scheme.

"9. It seems also essential that a small farm of 30 acres should be attached to each school, otherwise there will be no practical instruction. It may be remarked that, unless there is such a farm, the agricultural instruction will have only about an hour's work a day. This farm might be managed as proposed by a committee consisting of the Collector and other persons recommended by him, with the Head Master as Secretary."

The Board objected to the idea of compulsion which, it will be observed, was for theoretical class instruction merely, and not for field work which was *optional*, but approved of inducements in the way of reduced fees and scholarships tenable at Saidápet. As regards making agriculture a subject of the Special Test Examination, they approved of the idea as an alternative subject in the Revenue branch. Government accepted the scheme as a tentative measure, but considered that, as elsewhere suggested by the Board, the farm annexe of 30 acres might be arranged for after it was seen how the classes filled. Mr. Benson had already objected to the omission of the farm for practical instruction side by side with school-room teaching.

Papers in Board's Proceedings, No. 2864, dated 18th November 1881.

161. In August 1881, Mr. Grigg, then Director of Public Instruction, made the following remarks:—

"2. The scheme recommended by Colonel Macdonald seems to be (1) that instruction both in-door and out-door, should be given in Agriculture in the Upper Fourth, the Fifth, and, to some extent, in the Sixth Class also, thus constituting a curriculum extending over three years, the course being optional; that students should be induced to join the Agricultural classes by a reduction in the scale of fees, by the grant of two scholarships at each College, tenable for two years in the Agricultural School, on the results of the examination at the close of the third year, by exempting all students passing at this examination from the preparatory (first year's) course at the School of Agriculture; and that this examination be made one of the Special Tests for the Revenue Department; (2) that an Instructor in Agriculture should be appointed at each of the schools concerned, to be subordinate to the Head Master in matters connected with instruction; (3) that a small farm of 30 acres be attached to each school, the farm being managed by a Committee.

"3. The Board of Revenue objected to the agricultural course being made compulsory, but the Government, whilst generally accepting the scheme, do not refer to the matter, but as regards the farm portion of the scheme, they direct that it is to remain in abeyance until it is seen how the classes work.

"4. The determination that the instruction shall be optional is, I think, open to grave question, and I trust the Government will be pleased, for the reasons assigned below, to modify the order in this respect. The Board, in expressing their decided opposition to Mr. Benson's proposal, that instruction should be compulsory, seem to have overlooked the fact that the suggestion relates to *in-door* instruction only and not to out-door, and also the fact that instruction in agriculture is already compulsory in some classes of Government schools, and that in the High School the study of Chemistry is compulsory, which forms one of the most important subjects in the course of agriculture at Saidápet, whilst the study of Physics, an allied subject, not at present, included in the agricultural course, though very suitable, is also a compulsory subject in High School classes; also that the simple course suggested by Mr. Benson for in-door work can easily be provided for without injuriously affecting the prescribed course in any class in the Middle School or High School Departments. The Government are aware that under the revised notification for the Middle School Examination pupils must appear in the five principal subjects of study of the Upper Fourth Class, viz., English and a second language, Arithmetic, Geography, and Indian History, and in Mathematics; also in one of the optional subjects noted in the margin. It is usual to take up English History, as this is a subject of study in the class, but there is no hardship in requiring pupils in certain schools to appear in agriculture; in fact, they would be at an advantage in so doing, because they will have the benefit of a special instructor, and would probably soon do so of their own free will, when the intention of Government to have a Special Test in Agriculture for the Revenue Department is notified. Again in the Upper Fourth Class there is room for the subject, as the Government have approved the omission, for the present, of Hygiene for the Middle School Examination, which was a subject of study in the Upper Fourth Class. Apart, however, from the above considerations, I would strongly advise that, so far as *in-door* instruction is concerned, the subject should be made compulsory in the classes concerned, or not taught at all. These optional in-door classes will only produce confusion in school management besides loss to Government in the shape of fees, whilst the boys are too young really to have any choice in the matter, and will practically do whatever they are told to do by the Head Master.

Physical Geography, Introduction to Science, English History, Physiology, Political Economy and Agriculture.

"5. I beg therefore to urge that the subject in the schools concerned form a portion of the ordinary curriculum. I am desirous, moreover, of placing the study of the subject on a more equal footing with other subjects, more especially as regards the Middle School Examination, a pass in which now constitutes the minimum general education qualification for admission to the School of Agriculture. In other subjects the course of the Lower Fourth Class forms a preparation for the course in the Upper Fourth Class, the test of which is the Middle School Examination. But according to the scheme already submitted, Agriculture is not to be taught in the Lower Fourth Class. This, I think, is a mistake which must be rectified, if it is to be made compulsory in the Upper Fourth Class. The subject is already compulsory in the Third Class.

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"8. I do not think that the above proposals, which are somewhat similar to the Bombay scheme, will add materially to the work of the classes concerned, and I would take special precaution that it should not be permitted to interfere with other, relatively more important, studies at these periods of a pupil's career. I would also take care that the subjects are taught, as far as possible, experimentally, so far as this can be done in the school-room, by specimens, models, &c.

"9. The Government will observe that I have not referred to out-door work or the creation of a small farm at each school. In doing so, I have acted on the views expressed by Government, and would here record an opinion that practical work on a farm is quite out of place, so far as the Middle School classes are concerned, and, in any case, should only be optional by-and-bye in the case of High School students. If farms are to be started in course of time, the students should be composed mainly of ex-pupils or others, who might form a class to pass through, in the

district, the first year's or preparatory course, theoretical and practical, required at Saidápet, so as to qualify for the Special Agricultural Test, or for immediate admission to the two years' course at Saidápet. I am disposed to think that there will be no lack of pupils to form such an out-of-school-hour class when a Special Test in Agriculture is presented.

"10. I do not think that it is necessary to offer any special inducements to the pupils to excel in the course except that the pupil passing first from his school in Agriculture and Political Economy at the Middle School Examination shall be eligible for a stipendiary studentship at Saidápet of the lowest grade, and that the student of a school obtaining the highest aggregate marks in Physics and Chemistry at the Matriculation Examination, and in the other Agricultural subjects at an examination to be held simultaneously, shall be eligible for a stipendiary studentship of the second grade. I propose to introduce the study into the classes gradually, as, if the scheme is introduced suddenly in its integrity, the boys in the upper classes would be placed at a disadvantage."

As regards High Schools, the Director subsequently abandoned his proposals as the University had made such changes in the Matriculation Examination as left no time for the study of agriculture. But as regards the Middle School he further remarked as follows :—

"2. In the Middle School, however, there is no difficulty so far as time is concerned; and I would suggest that Mr. Robertson's Agricultural Class-book, which is the text-book of this subject in the Middle Examination, be studied in the Upper Fourth Class without 'Easy Lessons in Money Matters;' and with this view I am proposing to omit the latter in the revised notification of the Middle Examination. The book, however, is not more than sufficient for one year's work, so that the whole of it may be prescribed for this class. In the Lower Fourth Class I would, as proposed in my letter under reference, provide for oral lessons in agriculture, until Mr. Robertson's Agricultural Primer, now in preparation, is published. No English Primer that I have seen is suitable for *young* children in this country, nor is Mr. Robertson, whom I have consulted, able to recommend one. In the Third Class I would not give instruction in the subject. Children should be well able to acquire the rudiments of the science in a two years' course in the Lower and Upper Fourth Classes. Time can be found in the Lower Fourth Class, as the study of English History will no longer be compulsory in Middle schools.

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"4. The pupils of these schools would be required to take up agriculture in the Middle Examination, and would thus not be placed at any disadvantage in regard to other schools."

162. The Board objected to many of these proposals in the following remarks :—

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"4. The Director urges that agriculture might be made a compulsory subject of study without injuriously affecting the prescribed course in any class in the Middle School or High School Departments; and referring to the subjects prescribed for the Middle School Examination, he proceeds to argue that were agriculture a compulsory subject in the scholastic course, it could be taken up at the Middle School Examination in the stead of English History, and that the pupils would themselves elect to be examined in agriculture as soon as Government declared this subject to be one required for the Special Test in the Revenue Department.

"5. Regarding the introduction of the subject into the list of those prescribed for the Special Test, the Board * have already recorded their opinion that there are insuperable difficulties in the way of its being prescribed except as an additional and optional subject; but if these could be overcome, it is probable that those pupils who, in the Director's view, would 'be at an advantage' in taking it up at the Middle School Examination, would require no compulsion to induce them to study it were the subject left to their option in the school course.

* Proceedings, dated 1st April 1881, No. 552, para. 3.

"6. The Board do not regard the proposal to introduce the study of agriculture into mofussil schools as a scheme by which the general course of education in those schools is to be permanently modified for all students. The present proposals are of an experimental character, and, in the event of the experiment succeeding and becoming popular, it is probable that separate agricultural schools will hereafter be established. With this prospect in view the Board share the Director's anxiety to render the proposed classes successful, but they do not agree with the Director that this end can best be accomplished by forcing it upon the pupils. Such of them as may contemplate entering the service of Government, or intend to become lawyers or medical practitioners, will not alter their intention and become farmers merely because they have acquired an elementary knowledge of the science of agriculture. To such pupils, and they must always be numerous, the Director's proposal would be unfair as necessitating in their case the neglect of other subjects of more importance to them.

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"9. Further, the Board altogether dissent from the Director's opinion, expressed at paragraph 10 of his letter, that no special inducements need be held out to the pupils,—that is (it is presumed), in the shape of reduction in fees, &c. Possibly under a compulsory system these concessions might be dispensed with, but otherwise they should properly be given to attract pupils to the special study."

163. The Director of Agriculture who was consulted by Government replied as follows:—

"I see no objection to the proposed introduction into the curriculum of the Lower and Upper Fourth classes of the Middle schools of theoretical instruction in agriculture, nor do I see any objection to making the subject compulsory in these classes as it is now in the Third, but instruction in agriculture is not, in my opinion, sufficiently provided for in the general educational scheme of the Presidency to admit of its being at present prescribed as a compulsory subject for the Revenue Higher test."

The Government finally decided to introduce the following scheme into the Government High and Middle Schools at Bellary, Salem and Madura:—

"*Lower Fourth Class.*—Oral instruction pending the introduction of Robertson's Agricultural Primer.

"*Upper Fourth Class.*—Robertson's Agricultural Class-book.

"*Fifth and Sixth Classes.*—Wrightson's Handbook of Agriculture, and Geikie's Physical Geography; to be substituted for such portion of the Sanskrit or vernacular course as is not essential for the Matriculation Examination, or for such other parts of the curriculum as the Director of Public Instruction may recommend.

"2. The above course will be compulsory in Middle schools but optional in High schools. The Director, Public Instruction, will report what special inducements it would be desirable to hold out in order to secure an adequate attendance in the High school agricultural classes."

But the scheme was never carried out for the reasons stated by the Director in his letter, No. 4625, dated 21st July 1887, as follows:—

"I have the honor to state that the scheme of agricultural instruction was not introduced into the Government High schools mentioned, pending the reorganization of the College of Agriculture. The Government institutions were subsequently transferred to the management of local bodies. Moreover, the general transfer of secondary institutions to local management has prevented the department from taking any direct action for the introduction of teaching in agriculture into such schools, but if local bodies organize classes for instruction in agriculture in connection with their High schools, aid from Provincial funds will be given under the provisions of chapter V of the Grant-in-Aid Code."

164. Here the matter rests. The questions for consideration are (1) whether agricultural instruction should be given in such schools; (2) whether it should be theoretical or practical; (3) whether compulsory or optional; (4) if the latter, whether any, and if so what, inducements should be offered for its acceptance; (5) in what way it can be practically carried out, whether it be mere school-room instruction, or combined with out-door training.

165. In considering the first point, Middle and High schools should probably be distinguished. The Middle School test is a general one; probably most boys who pass it go no further, but are content either because this is the test for Government service, or because means, tastes, capacity, or status do not admit of going on to a University course. On the other hand, High school boys are probably on their way to the University, at least so far as Matriculation, either for Government service or for some profession; for these latter, agricultural education is hardly necessary and probably other studies leave no time for its prosecution. On the other hand, however, it may be argued (1) that Matriculation is daily becoming the lowest test, in practice, for entering Government service, for which in most branches a knowledge of agriculture is very desirable; (2) that the Saidápet College should be recruited from High schools, and the candidates should have at least an elementary knowledge of agriculture before proceeding to Saidápet; (3) that many Matriculates, F.A's., &c., take to the educational service, in which a knowledge of agriculture will be of great importance, especially if agricultural education takes its proper place in the popular curriculum. For Middle school boys, it would seem that a knowledge of the rudiments of agriculture would be most desirable, while the out-door instruction would be of much value to them, as well as to High school boys, as a healthful exercise and recreation.

The remarks of the Board as to the necessity for a widespread extension of agricultural education have been mentioned above.

166. As to whether the teaching should be theoretical only or practical also, opinions evidently differ; the agricultural experts, and Colonel Macdonald are strongly of opinion that practical farm work, or at least demonstration, are necessary; the present Director of Public Instruction objects to all out-door work, and would give only class teaching combined with the study of specimens and models. It will be

remembered that the proposals for agricultural instruction in these schools originated in the idea of numerous district and taluk farms which were to be partly experimental and example, partly educational, for which latter purpose they were to be associated with existing schools. Moreover, the Board expressly stated that the education was to benefit those hundreds of lads who, while taking to Matriculation studies, failed to get into Government service and who would therefore be thrown back upon other employments, including those of their original home-life which probably included landholding. But for such boys, a modicum of book-knowledge would be a very poor equipment, and being book-knowledge would speedily be forgotten; this latter argument applies generally to lads so instructed, whereas the object of such training is to make agricultural principles part of a lad's mental stock-in-trade by fixing them in his mind through practical demonstration; the school farm would be to the agricultural class what the laboratory is to the class in chemistry or physics. It should be also noticed that the best lads were to proceed direct to Saidápet, and that, as Mr. Benson has repeatedly stated, lads entering at Saidápet ought, before all things, to have had *practical* elementary training in agriculture, not merely to reduce the Saidápet course to two years, but in order that the theoretical teaching might take a firmer grip of minds already conversant with the practice of the art. Ryots' sons proper will not go to Saidápet, but landholders' sons may, and these should have a preliminary field training, so that they may understand how and where principles apply.

As remarked by the present Director of Public Instruction, in his review of the College report for 1887-88, "the establishment of schools of agriculture in the provinces might do away with the necessity of continuing the school or junior department, but the prospect of the establishment of such schools is still, it would seem, remote." The junior department of the college is to meet the needs of persons who cannot or do not require to go through the full college course.

Finally, the effect upon the bodily health of the lads may be considered; work in a garden or field is usually found to be a recreation rather than a task to lads engaged 6 days a week in close school rooms, and as a healthful exercise is not to be surpassed, while it supplies the best of fields for the cultivation of the observing powers; it will give a lad a chance of, and taste for, reading direct from the book of Nature instead of from the text-book and will help to give a greater dignity to manual labour. It may be added that the Bombay Government (Sir Richard Temple, Governor) were of opinion that practical field work on a small farm attached to a High school is of "primary importance." It is not, however, intended that boys at these schools should be turned into farmers; that would be impossible and undesirable; all that is suggested is that there should be field demonstrations and practice, both as a mental discipline and recreation, of the principles inculcated in the class-room.

167. Points 3 and 4, viz., whether the instruction should be compulsory or optional, with the nature of any inducements to be offered, are sufficiently suggested for discussion in the extracts given above. Point 5, viz., the mode of carrying out the instruction, remains for consideration. The probability of local bodies taking up the matter, the teachers available, the possibility of a farm or garden, should it be desired to attach one, are matters for consideration. Little can be said as to the probable action of local bodies. As to teachers, that will largely depend on the future work of the Saidápet Agricultural College, and the Teachers' College now located there, with the view of training high class teachers in agriculture. As for the farm or garden, the decision of the Committee may possibly be guided by their opinion as to the desirability of district and taluk farms or agricultural stations, the *raisons-d' être* of which are briefly summed up in paragraph 111 *supra*; or the District Primary Normal School farm, should this be separate from the district farm, may be utilized as suggested in the following extract from a letter read in Board's Proceedings, No. 277, dated 15th August 1887.

"Finally, the Agricultural branch of the Normal School should be simultaneously made available for the sons of farmers, Middle school students, or others; it would thus form the 'progressive school' where lads who wish to prosecute their agricultural studies can do so without quitting their district. Though this is not the immediate duty of a Normal School, yet, in this poor country, it is necessary to combine duties, and I see no other chance of

giving a practical education in agricultural or other industries; nor need the extra students interfere with Normal School work, since they would enter only for the agricultural or industrial branch."

168. There is another class of agricultural instruction which has not been hitherto proposed for South India, except at the commencement of the Saidápet Farm, when apprentices were taken to learn farm-management. This plan was not a success, as the apprentices were not of the ryot class and had no proper education. There will probably be young men who, having learnt all that was to be learnt of agricultural science at the Primary or Middle school, would wish to study not high agricultural science, but the best farm-management with a view to practical work on their own farms or as managers. The class is similar to that provided for in the French *fermes-écôles* mentioned in paragraph 123 *supra*. It does not appear, however, that such a class will arise for some years to come, viz., until the other modes of instruction now proposed are in full operation; hence it does not seem necessary for this Committee to consider the question.

169. It remains to consider the higher agricultural education which is to provide the country with high class farmers, farm superintendents, teachers of agriculture, officers of the Agricultural Department. In this connection, questions 9 to 12 will be considered.

170. The origin of the College in 1876 has been mentioned above, paras. 8 to 18 Mr. Benson has abstracted its history till 1884 as follows :—

" *Agricultural Education.*—The development of the general policy of Government, which in 1876 led to the foundation of the School of Agriculture, has already been alluded to. A complete abstract of the discussions on the subject is given in the first annual report of the College, *i.e.*, that for 1876-77. The institution was then placed under the general control of the Director of Public Instruction acting in communication with the Board of Revenue and in charge of the Superintendent of Government Farms. Twenty-four stipends were offered for competition amongst students, to be awarded at the close of the first session, and a class of 30 students was formed, and the institution began work in the granary belonging to the Saidápet Farm in November 1876. At the same time arrangements were made for the attendance of 13 students of the Normal School, Madras, at the lectures on agriculture. The curriculum was to embrace Agriculture, Veterinary Surgery and Medicine, Chemistry, Botany, Zoology, Geology, Land Surveying and Mensuration, Mechanics, Drawing and Book-keeping. The temporary arrangements as to accommodation were found excessively inconvenient, and their inadequacy prevented the admission of any new class in 1877. In 1878, however, a laboratory was commenced and temporary special buildings were erected for use as class rooms. A fresh class was formed in the October of that year consisting of 33 students, the number of stipends offered having been reduced to 15. In the year 1878-79 it was determined to start a veterinary hospital in connection with the college, the want having been long felt, and buildings for that purpose were erected in the year following. Rules for the award of the college certificate were also framed, and it was determined to alter from the beginning of 1881 the date for the admission of classes from September to April so as to allow of Matriculated students being admitted soon after passing their examination. The Lecturer on Zoology also resigned during this year, and no one was appointed in his place. During the summer of 1879, orders were given for the entertainment of another class of students, but the number of stipends offered by Government was cut down from 15 to 5, and it was found impossible to form a class of fair size, and the entertainment thereof was postponed till April 1880. In the meanwhile the Government were asked to reconsider their decision, but declined to do so, and ordered the Board to endeavour to induce zemindars to send pupils to the college, and suggested that the Court of Wards might do the same. These proposals did not meet with a favorable response from the zemindars, and the Court of Wards did not consider themselves justified in sending pupils to the college, and the matter was allowed to drop.

G.O., dated 22nd August 1878, No. 1348.

G.O., dated 26th May 1879, No. 1144.

G.O., dated 26th November 1879, No. 2203.

G.O., dated 6th October 1880, No. 1300.

" In the meanwhile the first class of students admitted had completed their course and left the college in June 1879, 16 gaining a first and 7 a second class certificate from the institution, leaving only one class under tuition for the greater part of the year. Early in 1880, the permanent buildings for the college were begun, and the veterinary hospital was nearly completed during the year. Early in the year a proposal to raise the standard for admission was made, but any alteration was postponed after discussion for fear of the effects.

"The summer session of 1880 began with two classes—one the senior of 24, and another, newly admitted, of 10 students. In the latter class not one of the 8 applicants qualified for immediate admission was a Madras man. By the winter session 3 students of the senior class had left and one withdrew to join the junior class. During this year the general control of the institution was transferred from the Board to the Director of Public Instruction, progress was made in the erection of the permanent buildings, and the veterinary hospital was completed, but not opened.

G.O., dated 12th Aug. 1882, No. 256, Educational Department.

"In the year 1881-82, a new class of 9 students was admitted in April, and at the end of the summer session 24 senior students obtained the certificate of the institution. During this year a new scheme for working the institution was brought into force and a class of 26 students admitted at the beginning of the winter session. That scheme was briefly :

Admission to be open to the same classes as before, the educational qualification being practically the same except that a first-class Middle School certificate was not required.

Students to be of three classes—stipendiary, free and paying.

Stipends to begin at once, increasing year by year, the rates differing for students from certain districts as in the case of Normal students.

Number of stipends fixed at fifteen, ten, or two-thirds of the stipends, being annually awarded to ten districts, to be given on recommendation of Collectors to induce them to send young revenue employés for the course, and one-third by the Superintendent.

Full course to be three years.

"During the year the lower story of the college buildings was completed and formally opened by His Excellency the Governor, and the veterinary hospital was completed and placed in charge of the Inspector of Cattle Diseases."

The above scheme was intended to link the College with the Land Administration of the Presidency, it being expected that Collectors would nominate young revenue employés, while those nominated by the superintendent were to be connected with Agriculture or the Revenue Administration. The dual control was found to be unsatisfactory, and in 1884 Government transferred the College entirely to the Educational Department, the cost being met by arrangements in the transfer of certain classes of education to Local Boards. An annexe of about 30 acres of the Saidápet Farm was attached to the College for practical instruction.

Papers in G.O., No. 194, dated 16th February 1885, Revenue.

171. In 1884, the Director of Public Instruction, Mr. Grigg, submitted his views on the institution; these are too important to abstract and are as follows :—

"2. The objects of the institution, I think, should be (*a*) to teach the science of agriculture (*b*) veterinary medicine and surgery, (*c*) forestry.

"3. Agriculture I would teach as a science in connection with the various sciences allied thereto theoretically, and also practically and experimentally so far as a practical and experimental knowledge is necessary for understanding the science. The end in view should be not to attempt to turn out finished practical farmers, but to supply the public revenue service of the country and the large agricultural capitalists with servants who have a sound scientific knowledge of the principles of good tillage, of the chemical combinations in soils essential for high productive power, of the great classes of plants, and the conditions of healthful development of plant-life, of the art of treating the diseases of cattle, and also of principles of rearing and managing stock, of mensuration and land surveying with some acquaintance with mechanics and geometrical drawing. In addition to these subjects, I would also add instruction in the Revenue Regulations and Acts, and also in Accounts, so that students may have special opportunities of qualifying for the Revenue Special Tests.

"4. The course itself should comprise Agriculture, Chemistry (organic and inorganic), Elementary Physics, Geology, Botany, Zoology, Entomology, Elementary Veterinary Surgery and Medicine, Mensuration and Land surveying, Mechanics, Revenue Acts and Regulations and Accounts.

"5. To acquire a satisfactory knowledge of these subjects, a course of study extending over about 33 months or five sessions of about five months each is necessary. A high standard of general knowledge is essential for such a course, and I would fix it at that of the F.A. Examination—the standard for the higher diplomas in Civil Engineering and Medicine. I would also require candidates for admission to pass a simple entrance examination in the rudiments of agriculture and also on existing agricultural practice, so as to ensure the supply of students who have already some practical acquaintance with the subject. I make this suggestion in consideration of the fact that the vast majority of the students of our schools are the sons of men directly or indirectly connected with the land, and possessing almost an hereditary instinct for the cultivation of land. At the conclusion of this course, a public examination

should be held as suggested in my letter on technical education. To encourage men to undergo the course, I would notify that, after a certain date, preference will be given in appointments to Tahsildarships or Deputy Tahsildarships, and Revenue appointments, especially those in the Department of Agriculture and Revenue Settlement, carrying salaries of not less than Rs. 50 to men who had secured the diploma. As the course would occupy practically three years, I would allow each Collector to nominate a student once in three years, so that each year's class would be at least twenty-one strong. If the Government would sanction the above notification, I think so far from stipends being necessary, a fee of Rs. 50 a term might be collected. I would limit the strength of the class for each year to about 40.

"6. Besides providing this higher course for advanced undergraduates, I would institute a short elementary course not to exceed three sessions, of about five months each, for men of inferior education represented by the present standard, that of the Middle School, Second Class. The course of study should comprise the outlines of Agriculture, Agricultural Botany, Elementary Geology, outlines of Zoology, Mensuration, and Elements of Land Surveying; rearing and feeding of cattle, cattle-diseases and their treatment, Revenue Regulations and Accounts. The class is intended to do the work now done by elementary winter agricultural classes for peasants established in some towns in Germany.

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"8. To encourage students to attend the lower department, I would suggest that Revenue officers be instructed, after a prescribed date, to give preference to men who have gone through this course (to be tested by a public examination) with success, in appointing to Revenue Inspectorships, small Gumastahships and to the Headships or Curnamships of very important villages.

"9. I have stated above my conviction that the course of study in the school should be chiefly scientific, but whilst holding this view I am decidedly of opinion that the students should have practical demonstration of agricultural methods, of agricultural mechanics, and of other branches of knowledge allied to the study of agriculture, in which every sound educationist would demand that theoretical teaching should be supplemented by practical and experimental. In order to study a subject successfully, so that it may make an abiding impression on the memory, it is necessary that a student should see with his eyes the working out of the principles and assertions he hears with his ears. Principles so inculcated sink into the mind and will be appealed to when the student is cast on his own resources in afterlife. Moreover, in India, it is especially necessary by practical work in the laboratory, in the farm workshop, in the field and in the cattle-shed to teach young men, who have been accustomed to see every industrial operation done by a menial deputy, the necessity of conducting such operations with their own hands, if they are to acquire a thorough and masterful knowledge. For a Hindu youth, to have gone through such a course, whatever his future calling may be, is a better education in many cases than to have spent the time in simply acquiring a larger knowledge of books. The Saidápet institution has already done this to some extent; witness the fact that each student, whatever his rank or caste, learns to plough with his own hands and perform other farm operations. It is admitted by most authorities, more especially those in America, where agricultural technical education is most highly prized, that no School of Agriculture can make an accomplished farmer, but that it gives young men that command of principles and varied knowledge of things, which provide them not only with the potentiality of becoming good farmers if they adopt farming as their profession, but also with that species of knowledge which will be of the greatest service to men who seek to follow professions more or less directly connected with the land. So, regarding the Saidápet institution, I would be content, if besides providing those immediately interested in increasing the productiveness of the soil, and extending the range and variety of plant cultivation, the yield of which is beneficial to man, with highly educated men with special knowledge to aid them in that object, it also provides the Government, the merchant, and the manufacturer with servants who possess a fair practical knowledge of agriculture and its allied sciences and arts. Aided by such service, I feel assured that the country will make greater progress in material wealth and comfort than if all these employers of labor had mainly to depend upon the service of men whose knowledge is almost wholly scholastic and unpractical.

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"14. *Veterinary Department.*—At present temporary arrangements have been made in Saidápet for the giving of instruction in the elements of veterinary science by the Inspector of Cattle Diseases, who has also under instruction, I understand, certain apprentices or probationers, about 16 in number, who are, strictly speaking, not students of the College at all. There is also a hospital for animals attached, utilized by the Society for the Prevention of Cruelty to Animals. At present no portion of the cost of the veterinary establishment is borne by this department; considering the peripatetic duties of the Inspector, it is needless to say that the present arrangement, if the object is to educate skilful veterinarians, is unsatisfactory.

"15. I therefore submit, for the consideration of Government, that a distinct department be formed at Saidápet, and that this department, with the hospital, be worked entirely by this department. There can, I think, be no doubt if the requirements of Native States as well as of the British territory are taken into account, that there is good reason to expect that yearly

admissions would not fall short of 15, making the total annual strength, exclusive of paying students, 45, inclusive of farriers, or perhaps 60 in all. In addition to these special students, the ordinary students of the institution would have, as at present, to be instructed in the veterinary portion of their course. In an agricultural country like India, where diseases among cattle prevail so extensively, the expediency of creating a class of men specially qualified to treat such diseases needs no elaborate advocacy.

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"22. To encourage students to resort to the school it should be notified that the appointment of District Inspector of Cattle Diseases should be reserved for men obtaining college diplomas in order of merit. It would also, I think, be desirable to institute four or five annual stipends of Rs. 10, to be reserved in rotation for the several districts—the Collector nominating. The fee for paying students might be fixed at Rs. 30 the term. Native States and others to pay this fee when sending stipendiaries for training.

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"24. *Forestry.*—I have ventured to suggest the utilizing of the Saidápet institution also as a school of Forestry, because it seems to me that the regular staff of the school, if constituted as above proposed, might do much of the general work, such as Chemistry, Botany, Physiology, Geology, Mechanics, Surveying and Drawing, which must, I believe, be taught in a school of Forestry, whilst the special technical instruction could be afforded by a qualified forest officer to be attached to the institution in a position similar to that proposed for the Superintendent of Veterinary Teaching, assisted by such subordinate staff as might be considered necessary by the Forest authorities. The practical forest teaching might, I think, be obtained by requiring this professor to spend a certain portion of the year with his classes in one of the large forests worked by the department, and also by requiring a student to have passed a specific time in practical forest work before granting full diplomas. Encouragement to join the school could be afforded by limiting appointments to the forest subordinate service to men who have passed through the school. I merely, however, bring forward the proposal as a suggestion which might be referred to the Forest Department for report, if the Government view it favorably."

Government dealt with the whole question as follows :—

"4. The proposal to transfer the School of Agriculture to the Educational Department emanated first from the Director of Public Instruction who advocated it (and the transfer of the farm too) in a letter printed in Board's Proceedings, 18th November 1881, No. 2848, on the grounds that, in consequence of the Board's control over the farm, his own control over the school was merely nominal; that the division of authority prevented homogeneous action and continuous policy; and that, so long as this state of things lasted, the prospects of both farm and school were by no means promising. The Board, as then constituted, disapproved of the suggestion, and no further action was then taken.

"5. The proposal was revived last year on the ground that all other educational charges were charged to 'Provincial—Educational.' The Director of Public Instruction was consulted, and in paragraph 4 of his reply (printed in G.O., Revenue, 27th July 1883, No. 919) advocated the separation of the functions of Principal of the School and Superintendent of Government Farms. The views of the Board and Director of Agriculture were then called for on this and other matters. Their replies are recorded in G.O., 7th January 1884, No. 3. Mr. Wilson, with whom the Board entirely agreed, was of opinion that an Agricultural Reporter could not travel about and make himself acquainted with the agricultural conditions of the Presidency so long as his connection with the School of Agriculture remained unsevered. He showed also that the school had been a failure chiefly because it was impossible to give the students that careful and individual training in practical farming which was an indispensable preliminary of the scientific course, and which, in other countries, is given beforehand by independent farmers farming their own properties. His proposed remedy involves the separation of the school from the Agricultural Department, and the bringing of the latter into more practical and intimate relations with the agriculture of the country, precisely as contemplated by the Government of India. Under his scheme the School of Agriculture would be purely scientific, and the Agricultural Department nothing if not practical. After a while, it would be made a condition precedent of admission to the school that the candidate should have studied practical farming for two years. For the purpose of affording this practical training, Mr. Wilson at that time contemplated the establishment of Government example farms. But this idea he seems since to have abandoned. His Excellency the Governor in Council concurs entirely with the latest expression of the views of the Director of Settlement and Agriculture.

* * * * *

"10. It is also necessary to consider the policy to be adopted in regard to the School of Agriculture, and on this subject the views of the Director of Public Instruction are of importance. Mr. Wilson and the Board wish to confine the school to the scientific training of persons already practically acquainted with farming with a view to their employment as Agricultural Inspectors. The Director of Public Instruction apparently agrees as to the nature of the instruction to be given, but would bring the institution into closer connection with the public service by making a course of study there a necessary preliminary

to employment in 'certain branches of the Government service.' The end in view should in his opinion be 'to supply the public *revenue* service of the country and the large agricultural capitalists with servants who have a sound scientific knowledge of' agriculture and cognate subjects.

"11. In order to facilitate the attainment of this aim by encouraging attendance, the Director proposes—

(1) That after a certain date preference should be given in appointments in the Revenue, Revenue Settlement, and Agricultural Departments, carrying salaries of not less than Rs 50, to men who have secured the college diploma.

(2) That Collectors should be instructed, after a certain date, to give preference in subordinate revenue appointments to men who have gone through an elementary course of training at the college.

"12. The Government cannot but regard Mr. Grigg's proposals as premature and inadmissible. The importance of agricultural knowledge to revenue servants is exaggerated. The Revenue Department in the higher grades is not concerned with the land alone, but has also judicial functions to perform; and what is required for the service is a body of men who have given evidence of natural intelligence and who are proved to have gone through a course of intellectual training. The guarantees given by the college students under the first head are less than Government can command elsewhere, and those under the second are insufficient. The revenue service must be entirely reorganized and the conditions of admission readjusted before any proposal for granting preferential claims can be considered. There is reason in the proposal that the Veterinary Inspectors should be selected from the men trained by Mr. Mills at the college, and this proposal and that for the establishment of a School of Forestry in connection with the college will be referred for report through the Board of Revenue to the Director of Settlement and Agriculture and the Forest Department."

Further proposals for the college were also called for, and these were duly submitted by the Director and approved in 1886, from which year students were admitted under the new scheme. The new curricula are those of the Technical Educational scheme; the course was to be senior and junior, with major and minor stipends, these being rendered necessary because of the Government refusal to give the Agricultural diploma any special value as regards admission to the Revenue service. Mr. Grigg wrote as follows:—

G.O., No. 59, Educational, dated 29th January 1886.

"I have the honor, with reference to the orders of Government, 24th March 1885, Mis. No. 197; 3rd June 1885, No. 377, Educational; and 1st October 1885, No. 114, Revenue, to submit the following scheme of establishment for the Agricultural College, Saidápet.

"2. In the Technical Education scheme, sanctioned in the second of the orders above quoted, tests in Agriculture and the allied subjects have been provided for the elementary or school department, and also for the college department as explained in paragraphs 5 and 6 of my letter, 8th April 1884, No. 2275, printed in the first of the orders above read.

"3. The scheme of establishment now submitted provides instruction for students appearing for these tests * only and not for students seeking group certificates or diplomas in Forestry or Veterinary Surgery and Medicine; but I have reason to think, whether it is decided or not,† that the latter shall form a separate branch, that some students of the college will, after completion of their Agricultural course, take further advantage of the instruction afforded by the Inspector of Cattle Diseases in the neighbouring veterinary hospital, and ultimately qualify for the group certificate, or diploma in Veterinary Surgery and Medicine. I believe also as regards the former, although it has been definitely (G.O., 27th May 1885, No. 624) decided that Forestry shall not form a special department of the college that students who have obtained their diploma in Agriculture will probably, in course of time, qualify also for the higher or lower certificates in Forestry. It will be observed that the lower tests in Veterinary Surgery and Medicine and in Forestry form sub-tests in the examination for the Agricultural diploma."

* *Lower Test.*

Agriculture (preliminary) with Botany (preliminary), Inorganic Chemistry (preliminary), Physiography (preliminary), Pure Mathematics (first stage), Mensuration (preliminary), Animal Physiology (preliminary).

Diploma Tests.

Agriculture (advanced) with Botany, Physiography (preliminary), Economic Entomology, Geology (preliminary), Inorganic Chemistry (advanced), Organic Chemistry (preliminary), Forestry (preliminary), Animal Physiology (preliminary), Veterinary Surgery and Medicine (preliminary), Pure Mathematics (first and second stages), Mensuration, Building Materials and Construction, Road-making, Applied Mechanics (preliminary), Surveying and Levelling, Plan-drawing from Specification and Estimate-making and Hydraulic Engineering (preliminary).

† G.O., 19th May 1885, No. 588.

In this connection, the Committee are referred to the printed Calendar of the College supplied to each Member; especially paragraphs 11, 12, 14 to 26. The syllabuses were duly prepared by representative committees. Extensive alterations

have now been proposed in these curricula by the present Acting Principal, Mr. Keess, who, agreeing with his Assistants, would omit Mechanics, Mathematics, Mensuration, Building Materials and Forestry, would thus make the theoretical course one of only two years, and would then devote the third year to practical training on an improved farm, each students being obliged to cultivate with his own hands a block of a few acres,—say five,—while assisting also in the general work of a fifty-acre farm. Mr. Keess' objections and proposals are lengthy and cannot be conveniently inserted here. One reason for the proposal for a whole year's practical instruction is, doubtless, that the Examiners in 1887-88 expressed themselves unfavorably as to the practical knowledge of the candidates for the higher examination in agriculture.

172. The following table distributes the past and present students by nationality or caste.

(*a*) The great majority of the students are Hindus and belong to families holding land. Brahmins constitute the largest proportion of the students. The distribution of the past and present students of the College according to castes and nationalities is as follows:—

Europeans, Eurasians and Native Christians	29
Muhammadans	15
Parsees	18
Brahmins	156
Sudras and others	64
Total ..	282

On the question of the status of the students, there is no conclusive information. Mr. Robertson in his letter to this Committee says that at least three-fourths are connected with landed families. This expression is too vague to be of use; when about three-fourths of the whole population are actual agriculturists, and the possession of a piece of land is the first mark of respectability, it would be strange indeed if these men were not so connected. But that they are themselves cultivators or even of families which *themselves* carry on agricultural operations is not apparently the case; the papers throughout show that the great complaint has been that students are "ignorant of the art of agriculture," this being expressly stated by a late head of the College. Indeed the whole course of proposals for many years has been to obtain preliminary practical teaching before the lads enter the College. Moreover, if of the really agricultural class, those who fail or do not desire to get Government employments would at least make public the results of their training when they go down to their farms; this is not the case. The experience of Revenue officers is also against the idea that the students are agriculturists proper.

173. The next point is whether they go down to agriculture from the College. The following table has been supplied by the Acting Principal of the College:—

"Old students of the College are employed as follows:—

Those who are farming or are in charge of Farms and Gardens	39
Importers of Improved Implements	1
Instructors in Agricultural Schools and Colleges	6
Demonstrator of Agricultural Implements	1
Agricultural Department	17
Veterinary Department	25
Revenue Department	61
Forest Department	29
Salt Department	2
Police Department	2
Sanitary Inspector	1
Pleader	1
Editor of *Agricultural Journal*	1
Assistant Curator in Government Museum	1
Merchants	4
Unknown	24
Total ..	215"

Thirty-nine out of 215 are said to be engaged in farming. This, however, is a vague expression, and to judge by the fact that, except from those known to be on Government farms, from whom reports are necessary, there are no reports of work done by such farmers, very few are really working on farms. This result is of course to be expected for the following reasons:—(1) that the men are not of the status intended; (2) that though the responsible officers have ever been requesting a scheme for a preliminary practical training, no such scheme has ever been carried into effect; (3) that there is little practical training at the College, and *none* afterwards, since the district farms which these men were originally intended to superintend have never been started; (4) that there is as yet no demand for high class farm managers, especially as wealthy landholders are suspicious of new-fangled and improved ideas; (5) that agricultural education does not necessarily make a successful farmer; success demands business habits and energy, not necessarily found in a college student, even if practically trained; (6) that a man does not here, any more than in America, become a farmer, because he has been trained in an agricultural college; when he leaves the College, he takes up what promises best, whether the [illegible] be that of Government service in any branch, or a profession. To judge [illegible] America, the successful farmers turned out of the highly endowed and well taught agricultural colleges are very few, most men going to other professions, while farmers' sons do not usually seek the college. It is not to be expected that the students of a South Indian College which is a mere isolated institution, without any graduate preliminary course, and without any defined future, will necessarily or probably take to farming as a business: they *may* do so, but more probably they will not. Nevertheless there are signs that some few men show a real spirit of enterprise and of desire to do practical work, and this may easily be encouraged, especially by the establishment of preliminary teaching in the districts, and subsequent training of and provision for the graduates as suggested above.

BENGAL SECRETARIAT LIBRARY

174. There is a difference of opinion whether the College should continue to be under the Director of Public Instruction. Mr. Benson would put it under the Agricultural Department, the officers of which are alone acquainted with what is wanted in these men; in this he is corroborated by the practice on the Continent where primary education alone is under the Director of Public Instruction, and the higher education usually under the Agricultural Department. Mr. Robertson would have it bear the same relation to the Agricultural Department that the Medical and Engineering Colleges do to those departments; the Government, the Board and Director of 1883 and the Director of Public Instruction would have it under the Educational Department only.

175. In connection with the unpractical nature of the education and of the graduates, it may be well to mention Professor Wallace's opinion which coincides generally with that of the Professors of Agricultural Colleges whether in England or on the Continent. He says:—

"In this connexion it seems appropriate to clear up misapprehensions regarding the exact position of those whose whole scientific and practical training has been gained while passing through the usual Agricultural College curriculum, extending over two years and a few months. This should be of special interest to India, as I may say the so-called "Cirencester graduates," whether Indian or European, belong to this class. The idea that any man, however able, can gain a thorough knowledge of the science and practice of agriculture in little more than two years is a delusion of the most patent kind.

* * * * * *

"All that a college diploma shows, is that a student has, with considerable advantage to himself, passed through a course of scientific training in subjects allied to agriculture; that he has attended about 100 lectures on the scientific principles and practices of agriculture; that he has, to a greater or less degree, seen and had explained to him the field operations of a farm; and also that he has visited places where various description of stock are bred, and has been told how these are treated. But there is no diploma in the United Kingdom which is a guarantee that a man is capable of managing any branch of agriculture, either for himself or any one else. Without some years of actual practical training after, or partly before, the scientific course, I can, from intimate personal knowledge of the facts, attest that men are not qualified to direct the operations of a farm without blundering. They are not agricultural chemists, botanists, or veterinary surgeons; but they are most capable of beginning to learn actual farm work and management,—able to understand what comes before them, and to find out scientific reasons for successes or failures in practice. They have received a sound general training in the elements

of the most useful sciences entering into the practices of every day life on a farm. It must be clearly evident from the foregoing remarks that it was in vain to hope, as some imagined, that the Cirencester graduates, on their return to India, would be qualified to begin to teach the natives better systems of agriculture than their own. They were qualified to do no such thing. They should have been sent out into the districts to make themselves thoroughly conversant with native agricultural practices, to find out from the cultivators the reasons why each operation was performed in a particular fashion; and where this could not be done, to discover, by the light of their superior scientific knowledge, either a reason for the continuance of the practice, or a good and sufficient reason—based on fact, not conjecture or hearsay, but arrived at by means of a profound knowledge of detail—why they should be discontinued."

Similarly, Professor Jörgensen as quoted by Mr. Benson, in 1883, says :—

"One of the principal features of the instruction given by Professor Jörgensen at the college is that it is penetrated throughout by due knowledge of the country, its soil and climate, and of farming itself; this knowledge being built upon a thorough scientific basis. This of course must make his lectures especially useful and attractive to the young farmers who form his audience. Professor Jörgensen always reminds his pupils that practice truly and duly learnt to such an extent that the apprentice himself is able to perform all kinds of work on the farm and understand the whole management must be the real and chief foundation of the education of a farmer. He always recommends, as it now is generally the case, that practical farming should be thoroughly learned before going to the college. The college, he says, of course cannot possibly in about two years give anything more than a solid foundation of theoretical knowledge. But on this foundation you will be able to go further by your own work; and it will enable you to understand every phenomenon you meet with in your life as a farmer, and everything that sciences bring forth in relation to the different branches of farming."

There is then nothing extraordinary about our agricultural graduates who moreover have far less practical and subsequent opportunities than Cirencester graduates.

176. *Training of Teachers.*—All agricultural officers including Mr. Keess agree that the few lectures given to men of the Saidápet Teachers' College is practically useless; a few lectures and occasional walks round the farm can do nothing for them. At least the junior course should be passed by such men.

177. The veterinary question has been dealt with *supra* in paragraphs 69 to 76.

178. *Text-books.*—It is admitted by the Professors of the College that these are essential for district work but cannot yet be prepared owing to want of detailed district knowledge. This has yet to be gathered; meantime, text-books dealing with general principles can be prepared. But easy text-books dealing with the climate, soil, crops, vegetables and fruit, animals, manures, implements, and farm and garden management of each district are essential whether for schools or as part of a vernacular literature.

179. *Land improvements.*—The question of capital is one of the most important; experience shows that non-employment of capital is a large factor in the ryot's embarrassment. Not altogether because it is not procurable, for in many localities it is well-known that lands generally have increased in value ten-fold, and have since the rise in value been mortgaged over very great areas, but without any corresponding increase in agricultural development. It is not quite clear that there is an absence of agricultural capital when the annual registered transactions in land, chiefly sales and mortgages, aggregate some 1,200 lakhs per annum; part of this is no doubt fictitious, being a mere repetition on a sale-deed of the value of land already mortgaged to a similar value, but most of it represents genuine transactions for value, and shows how much potential capital is actually available in the value of land. Moreover, it is known that in many places capital is available for lending, but that whether from the backwardness or cautiousness of the ryot or the want of sufficient security to the money-lender, capital lies idle; income-tax inquiries have occasionally revealed numerous transactions when loans have been granted at from 5 to 7½ per cent. interest, and thence upward, and that the capitalist has money lying idle for want of good borrowers. On the other hand, most borrowers undoubtedly pay very high interest, having only their own security and that of their own lands to offer, and in a country of precarious climate, this security is often less than it should be; many, moreover, having only dry lands of no considerable value in themselves are altogether unable to borrow the money to dig a well, because the capitalist has no security that the well will be dug or will be a success, in which case the comparatively worthless dry lands will be his only security. It is rather fashionable to decry the "grasping

money-lender," but in fact he is a very useful person, and his charges are often high because of the want of security; in 1839 the inquiries that were made by order of the Imperial Government disclosed the facts that little land was saleable, that prices were very low; that little capital was lent upon land, and that interest was very high, seldom below 18 per cent. upon ordinary security in districts where 9 per cent. is now the ordinary rate. This want of capital, the universality of the money-lender, the high interest it bears in agricultural loans, and the difficulty of getting loans at all, are in no way peculiar to South India; the peasants of France and Germany in spite of their frugality are, when not aided by other industries, much embarrassed by want of capital, due however chiefly, at least in the former country, to the practice of buying out co-heirs in the little farms at the very high price which land bears; it has been said that the economic position in Europe is either that of landlord and tenant or peasant proprietor and money-lender, the latter being the complement of the peasant proprietor as the tenant is that of the landlord, the use of whose capital the tenant enjoys at a far lower rate than the peasant owner can borrow. In Germany, it is stated (Reports on Tenures of Land) that for short term loans even in Mutual Loan Associations of unlimited liability, the interest payable is $7\frac{1}{2}$ to $8\frac{1}{2}$ per cent. Capital being however in South India, as elsewhere, admittedly a requisite and difficult to obtain for the reasons stated, it remains to consider whether Government in the Agricultural Department can give effectual aid.

180. Government have decided on the advisability of granting loans for agricultural improvements so as to lessen the chances of famine. Act XIX of 1883 is the present Land Improvement Loans Act, and Act XII of 1884 is the Agriculturists Loans Act. Loans under the former are for all classes of agricultural improvement, chiefly irrigational; loans under the latter are (*a*) for obtaining seed and cattle and rebuilding houses of ryots, and (*b*) the relief of distress when distress has been officially declared to exist. The amount usually available in the budget is 3 lakhs, but very little is ever taken, various reasons, such as ignorance of Government willingness to lend, or suspicion of its intentions, worry and delay in inquiries, frequent refusals, large demands for bribes or perquisites by taluk and village officials, opposition of taluk officers on account of the trouble of inquiries and of their knowledge that money is often not used as it should be, opposition of village officers who are often the village money-lenders, strictness of recovery of instalments, and so forth. Much however can be done by individual care. A suggestion has been made to waive the compulsory repayment of loans in cases where the improvement has been actually carried out, interest at $6\frac{1}{4}$ per cent. being in such case made a fixed charge on the land until the ryot chooses to repay the principal. This does not, however, form one of the present rules. The general conditions are as follow:—

LAND IMPROVEMENT LOANS ACT.

Ordinary rules.

(1) Applicant to be ordinarily only the registered holder.
(2) Minimum loan, Rs. 100.
(3) Maximum loan, Rs. 5,000.
(4) Interest (ordinarily) $6\frac{1}{4}$ per cent., but may be reduced or waived on orders of Government.
(5) Period of repayment—15 to 35 years, according to amount.
(6) Date of repayment—to begin from the end of second or third year: from the end of fifth year in special cases.
(7) Security by mortgage on the land with other collateral security in land. Total value one-fourth above proposed loan.
(8) Inquiry to be local and careful.
(9) Loans to be applied—under penalty—only to purpose for which obtained.

Special rules for wells in special districts.

(1) Maximum loan, Rs. 750.
(2) Interest, 3 per cent.
(3) Period of repayment—up to 35 years.
(4) Date of first instalment—last instalment of land revenue not being less than six months from loan.
(5) Security—only the ayakat or land to be watered by the well—loan not to exceed half the estimated prospective value.
(6) Method of repayment—By special charge upon the ayakat not exceeding one anna per rupee of loan or Rs. 5 per acre, whichever is less; in addition to ordinary assessment.

Agriculturists Loans Act.

A. Rules.

Maximum loan, Rs. 1,000.
Interest, 6¼ per cent., to *nil.*
Term of repayment—For seed, 1 year; for cattle, 2 years, or up to 10, with special sanction.
Security—Mortgage on lands of borrower.

B. Rules.

Maximum loan, Rs. 200.
Interest, *nil.*
Maximum term, 3 years.
Occasion—only when existence of distress has been recognized by Government.
Object—Subsistence till ripening of next harvest.

Since 1883, the statistics are as follows :—

Year.	Land Improvement Loans Act.		Agriculturists Loans Act.	
	Budget allotment.	Actual loans.	Budget allotment.	Actual loans.
	RS.	RS.	RS.	RS.
1883-84	2,00,000	9,135	..	..
1884-85	2,00,000	34,053	..	..
1885-86	2,00,000	2,925	..	..
1886-87	2,00,000	8,057	1,00,000	19,100
1887-88	2,00,000	77,507	1,00,000	40,034
1888-89	2,00,000		1,00,000	

It will be observed that the granting of these loans is, at present, solely under the supervision of the Land Revenue Department; all loans are inquired into and disposed of by the ordinary Revenue officers in the districts and by the Land Revenue Commissioners in the Board of Revenue. The matter, however, seems rather to be within the province of the Agricultural Department, especially if more completely organized.

181. It remains to consider whether Government interference cannot be usefully extended. There are several obvious methods besides that of direct loans to separate individuals, *e.g.*, that of agricultural banks; that of stimulation and supervision of mutual loan associations; that of indirect loans by granting sums to associations of unlimited liability which deal direct with individuals.

182 The first method has, it is believed, been definitely negatived by Government; in this plan, Government was to clear away all liabilities over a given area, and a joint-stock bank was then (1) to pay back to Government with 4 per cent. interest the advances thus made, (2) to recover these advances from the ryot with interest not exceeding a certain maximum, (3) to grant new loans to ryots on similarly easy terms, (4) to have the aid of Government in the last resort to recover the bank dues as though arrears of land revenue, (5) to enjoy the privilege of transactions free of or at lower rates of stamp duty, registration and process fees, &c. The plan seemed based on a commercially unsound principle; it could succeed only by using the engine of Government coercive powers, and by privileged freedom from expenses. The ryot would possibly get money a little cheaper, but at the cost of Government both in reputation and in pocket, by which only the bank would be protected from difficulty. Obviously, moreover, it would deal only with those in a fairly solvent condition, for the advances were only to be made to about two-thirds of the value of the land, on which the advance was to be a first charge next after the Government revenue.

183. The second plan is the encouragement, if possible, of local associations. These associations are in two or three districts (Chingleput and Arcot) extremely numerous; the principle is indigenous and in one form or other (lotteries, "chit"-associations, &c.) exists everywhere for mutual accommodation; a number of comparatively poor men get the use of considerable sums by monthly subscriptions, the monthly collection being handed in turn to each person as decided by the fall of the lot or in some less desirable way. Probably the department would be unable to give direct encouragement to such associations unless by extending the Savings Bank principle,

so that the local Government office (Treasury or Post office) could be made the depository of the association funds, but in the way of supervision it is desirable that Government should take some action, so as to ensure the genuineness and *bonâ fides* of the associations, and to give confidence to would-be members. At present, it is reported that such supervision is highly necessary, as many institutions are said to have been started, to have made considerable collections, and to have then failed to the loss of the confiding depositors. If public confidence is to be restored in the principle of association, the action of such "funds" (nidhi) should be regularly supervised. It may be possible that district agricultural associations or local fund unions will find it within their power to start *bonâ fide* funds of this sort.

184. The final plan is that of mutual associations something on the above principle, but drawing their capital *ab extra*, probably from Government, which would thus grant its loans not to individual ryots, but to associations of unlimited liability, who would deal with individual borrowers, viz., the members of the association. This is the German Raiffeisen principle, the only material difference being in the source of the capital which is obtained in Germany in the local market. These associations have been described * as follows:—

Reports on the Tenure of Land in European Countries.

"The Raiffeisen institutions are associations for obtaining capital from those who have, and lending capital to those who have not. They are associated banks, but they do not bank for the profit of this or that person. The whole benefit is received by all the members. No banking profit is levied, and hence the more monied members do not gain in a different proportion to the less monied members, as is the case in most unions where the former invest by contributions in the association. It is better that the profit should remain in the pockets of the present members; consequently the aim of the institution is only to charge as much interest as will pay the interest of the borrowed capital and repay the actual costs of management. The guarantee of such unions is by the joint liability of all members to the amount of all their property, for it is evident that mortgages upon their small properties would not always offer a sufficient guarantee. As in the Schultze-Delitsch Union, the members only can receive advances of money. This is a principle which must ever be firmly maintained, otherwise the unions would lose all appearance of self-help and become merely benevolent institutions."

If Government capital borrowed at 4 per cent. were lent to such associations or unions, individual borrowers being charged, say, 7 per cent. for the accommodation, there would be a profit of 3 per cent. on the transaction. This might be divided into two shares, one going to Government for the expenses of management and risk, the other as profit to the members of the association, divisible either annually or after a term of years; this latter reserved dividend is the Raiffeisen principle. Profits, which are intentionally kept at a minimum, are there paid into a reserve fund.

"This reserve fund is accumulated at compound interest until a certain fixed sum is obtained, when (and not until then) its income is at the disposal of the association for benevolent purposes, and in the case of a dissolution of the association, the capital is at the disposal of the association for the general benefit of the community. In the Raiffeisen institutions great weight is laid upon this indivisible reserve fund. It consists naturally in only a small degree of profit, for as has been already noticed, it is not the intention of the unions to make a profit for themselves. Whatever little profit is made would be of little use divided amongst the members in groschens; whereas, retained in its bulk and accumulated, it may in course of time become a considerable fund, which can be used for the greater benefit of the community. It is, however, a benefit not for this generation, but for the next, and will be of great use to the then poorer members or neighbours."

Under such a system, Government interference would be limited to the grant of lump sums to the unions, leaving the distribution to the union members, all of whom are liable in all their property for the whole sum; hence, as found by experience in the thousands of Schultze-Delitsch Unions (Fawcett's Political Economy, pp. 273-4), the members are very careful to admit only trustworthy ryots to the benefits of the union. These benefits are (1) the power of borrowing from the fund at the above easy rate, and without danger from the usurer, (2) the profit of $1\frac{1}{2}$ per cent. per annum above noted. The only other business by Government would be the periodical audit of the books and accounts, and the necessary account transactions coupled, of course, with the general supervision which would be necessary to prevent abuse. It does not appear that some such scheme is impossible; it is far less risky and less

troublesome than the present individual method of attempting to lend money, and would probably be far more acceptable and profitable to the ryot.

185. Whether Government money should be lent at all to the ryot is a different question; in the face of the immense capital annually changing hands in the sale and mortgage of lands, the very great difficulty with which this relatively petty amount can be spared by Government, and the probability that such a sum, if spared to work a well-organized Agricultural Department, would work a far greater benefit to the ryot, it is at least an arguable question.

186. *Other industries.*—Under question 14, the Committee are asked to discuss the question whether the Agricultural Department should be restricted to matters connected with agriculture. The Agricultural Departments of European countries deal with many matters not strictly agricultural; *e.g.*, in France, Prussia, Austria, Sweden, Italy and Switzerland, fisheries are under the Agricultural Department; in all the above, and in Denmark, Belgium and the Netherlands, the forests are similarly administered; irrigation and drainage are included in several countries; geological and mining surveys, trade in food produce, &c., are also found. It has been suggested by Mr. Benson in his letter prepared for this Committee that the Agricultural Department, as newly organized, should embrace agriculture proper, forests which are closely connected with agriculture, and other industries and trade, the whole being worked by one Director assisted by a Board. A similar proposal was also made by another officer who suggested a Bureau of Industries for agriculture and all rural industries on the model of the very successful Württemburg Bureau, organized principally by Dr. Von Steinbeis as described in the *Contemporary Review* for October 1886. This Bureau had a great effect in stimulating and reviving industries such as the decaying linen industry, a purely rural cottage manufacture, which was being destroyed by power looms and factories; by proper forethought, organization, teaching and expenditure, this was revived as an art industry, cottage Jacquard looms being introduced, and the weavers properly taught; the linen manufactures now compete successfully with the finest Irish fabrics. Similarly, jewellery and other small manufactures have been greatly revived. This Bureau consisted of a Director with a Board partly official, partly non-official, with head-quarters at Stuttgart and ramifications into the towns and villages.

Fisheries, it will be observed, are in almost every country a special care of the department, doubtless as being great agents in food production. The importance of fisheries, whether in fresh water or salt, in this country for the same purpose has been so often pointed out that it is unnecessary here to reiterate the arguments.

Forests have a still greater claim to union with this department if only a *modus vivendi* can be found; due provision for the wants of the future combined with care for present needs would probably be even more efficiently met than at present if the two departments were unitedly worked; see also paragraph 118 *supra*.

On the need for afforestation, it is unnecessary to dilate; the subject, however, seems a fitting one for the Agricultural Department, seeing that the fodder, firewood, implement and manural questions largely depend upon a proper village supply of wood.

187. *Summary.*—It remains to sum up the whole matter, and to present an abstract based upon the facts and arguments summarized in this Note. The items for consideration are (1) organization; (2) executive work including inquiries and improvements; (3) executive staff; (4) education; (5) inducements and stimuli to improvements.

188. *Organization.*—There is a necessity for a definite organization, deliberative, inquiring and experimental, educational and executive. The deliberative head might be a Director either under or part of the Board of Revenue, assisted by an Advisory Board in all connected branches, a central association or council of official and non-official members; district organizations affiliated to the central organization, and of which the principal members supply the central council, while having ramifications into the chief villages of the several districts; inquiries, experiments and reports to be made by these associations, which in time would disseminate useful information. Further inquiries and experiments requiring close and lengthy technical supervision to be made by the executive staff. See paras. 24, 105, 116 to 122.

189. *Executive work.*—This includes inquiry, experiment, demonstration, positive improvements effected by the departmental staff. *Inquiry* as ordered by the Government of India is the special duty laid down for the department; an analysis of the whole conditions of a locality, not merely agricultural, but economic, vital, climatic, &c.; an examination of the revenue and rental system of the area; its agricultural methods, wants and failings, and possibilities. This is clearly not a mere agricultural inquiry but economic, and requires, primarily, experts in the several branches of inquiry, of which agriculture is only one. Hence the desire of the Government of India that the inquiry should be in touch with existing administration.

The subjects and methods of inquiry have been dealt with in paras. 22—27, 34, 35, 88, 102 and 103 *supra.*

190. *Experiment and demonstration* have been mentioned *passim* and specially dealt with in paras. 109—115.

191. *Positive improvements* to be worked by this department are necessarily few; such are the distribution of seeds known to be good, and the supervision of their trial (paras. 44 to 47); stock-breeding if deemed advisable (59—68); the dealing with cattle disease (69—78); and the granting loans and fostering of facilities for the dissemination of capital (179—185).

192. *Executive staff.*—The executive staff, whether for inquiry, experiment, combating cattle disease or the introduction of positive improvements requires consideration, *e.g.*, its present sufficiency or otherwise, its efficiency, the objects of its work and the extension of its sphere of operation, the best method of utilizing it. Under sufficiency, must be considered the superior and subordinate staff, their *personnel* and numbers; if the central, divisional and district farms or stations are started, (paragraph 17 *supra*), several superior experts are required as suggested by Professor Wallace in his work on Indian Agriculture. But the experts can probably be obtained from local sources: it cannot now be necessary to send to Europe for men, seeing that men well-trained in theory are available, and require only a practical training to render them fit to be superintendents. Men trained as suggested above (paragraphs 112 and 113) will suffice for this duty, Mr. Benson being retained as Chief Agricultural Superintendent and Mr. Hazelton as Inspector of Cattle Diseases. The district agricultural stations would each require an Agricultural Inspector, equally well-trained in theory and practice, capable of observation, experiment and demonstration. But in addition to stationary agricultural officers, there would necessarily be itinerant officers who would supervise the work of village statistics whether for the district analysis and permanent record or for cattle-disease returns; these men would also take the place of the present Stock Inspectors. The paucity of these men has already been pointed out; they will need to be considerably increased if work is to be well and quickly done. It is difficult to suggest less than four Agricultural Inspectors per district for executive work of all kinds including inquiry, experiment, statistical and cattle-disease work.

193. *Education.*—The desiderata seem to be—primary education of an improved type with school farms and gardens for the ryot classes; agricultural instruction of a different and more scholastic kind, though with practical work superadded, for secondary schools; farm apprentices on district agricultural stations or Normal School farms; and a high class College for the thorough training of agriculturists, veterinarians and other Government servants, or private individuals, with junior courses for school-masters and others desiring a less complete course; all work to be on the basis of principles combined with practice or, as in the motto of the Royal Agricultural Society, "Practice with Science." Much is to be expected from education; it is only through the ryot that progress is possible, and it is only by getting him to think about and to think new thoughts about his work, and the conditions new and old that surround him, that this can be brought about. Education for the coming generation of ryots who will go to their work with new ideas about Nature and her operations, new observing powers, and an enlarged capacity for dealing with agricultural problems is essential; for the present race as well as for the coming race, other methods of education than the school are necessary as stated in the next section. The actual work of education amongst the coming generation may not be with the Agricultural Department itself, but, in considering a development in the efficiency of such a

department, it is necessary to consider what means will render its operations more efficient by promoting the intelligence and receptivity of the ryot, by developing the agents rather than the mere methods of production, and by provoking them to take the initiative instead of waiting for an impulse *ab extra*.

194. *Inducements to improvement.*—Such are the stimulation of competition, of pride in the farm and of devotion of capital and labor to it by a proper allotment of honors and rewards. These are of various kinds; honorary titles such as are understood and prized by the people and not foreign titles, especially such as will give local importance; substantial gifts such as ornaments which will be worn on State occasions and handed down to posterity as gifts to the men whom the Sirkar delighted to honor; prizes in kind or money, &c., for farms generally and for specific items of farm management; prizes at exhibitions if still considered necessary, or cattle fairs. Many of these incentives to competition, and—as remarked by a "Native Thinker"—to loyalty by reason of a good understanding and closer connection between Government and its subjects, will cost nothing and avail much; men of this country are not less but more readily acted upon by local grants of honor and emolument than the more independent Englishman or American, for whom nevertheless a piece of blue ribbon has its value. Under this head would also come inducements by the grant of loans for agricultural improvement (29 (5) and 180) which at present are administered by the Land Revenue Department but only on the principle of direct loans to individuals.

195. *Policy.*—What is greatly wanted is a distinct, decided and continuous policy. Inquiry, experiment, demonstration, education, positive action and aided private and associated enterprize,—whether any or all of them be adopted, it is necessary to continue perseveringly in the same course, much money and time having been wasted in change and discontinuity; demonstration gave place to experiment; experiment developed into the higher education which subsequently took the first place in the system; inquiry began more systematically only after 1883; positive improvements once begun have been dropped or failed for want of superintendence or money or attention or patience; the "general, generous and long continued support" suggested as necessary for exhibitions but which is equally essential for all efforts in agricultural improvement, has not been a feature of the agricultural administration as is admitted in the case of the central member of the department, viz., the experimental farm; the tendency indeed has been to require proof that an operation actually pays; though of all departments, this can, with most difficulty, show results that can be estimated or gauged whether in facts, or money, or in demonstrable improvements. Experiments are often of necessity costly failures; inquiries lead to little positive result; demonstration unless clear, certain, reiterated, and skilful, to all appearance bears little fruit; operations against cattle disease unless widespread, continuous, and based on intelligence and co-operation as yet almost wholly wanting show small results; education whether of the school or by the operations of the department must be continuous, attractive, and content for some years with merely awakening interest, intelligence and thought. It is indeed not incorrect to say that much of the work of the department must ever be in mere education, that is, in the mere awakening of dormant interest and thought, and that operations should be so directed as to cause this awakening over the widest area, in the speediest way, and in the most approved direction, for which end, inquiry, experiment, demonstration, education and all the various stimuli of an organized department are requisite. General recognition is required, on the one hand, that South Indian soils in general are poor; that if not exhausted yet, they are in process of exhaustion by the "*raub-cultur*"—the soil-robbing practices—of the general ryot who takes, but gives little back; that dry cultivation generally is and remains in that early agricultural stage—as of the European 17th or 18th centuries—in which the restorative practice is based on frequent bare fallows, aided by the casual droppings of cattle insufficiently fed and pastured only on the wild grass of common or waste lands; that the education of the ryots is in the lowest possible stage and general knowledge inconsiderable. On the other hand it is to be recognised that external conditions are those of a 19th century country, with a trade which takes away produce without manural return, in absolute peace and with a relatively dense population which makes great unreturned demands upon the soil. In other words, agriculture is in a stage behind the social and economic

conditions; it is on the "wild-field-grass" system when, by the demands of society, it should be on the fodder-crop and restorative system; agriculture is stationary, while the economic conditions are in rapid transition. A recognition of this seems necessary as a guide to policy and practice, both by those who have to lead or assist progress, and by the ryots who are the actual agents of production.

196. *Finances.*—It is not for this Committee to consider ways and means, further, possibly, than to limit proposals within probably practicable limits. Nevertheless, if it be considered that half-hearted and petty efforts are a waste of time, money and energy, but that a fully-developed department will, within human certainty, produce results commensurate with expenditure; if it be believed that a great province of peasant proprietors awaits development by Government action, that Government action is necessary to that end, and that therefore efforts worthy of the Government, of the revenue derived from the land and of the duty admittedly owing by Government to its *quasi*-tenants, are not only desirable but essential, it will doubtless be within the province of this Committee to record an opinion as to necessity for a "general, generous and long continued effort." One per cent. upon the revenue would provide amply for all expenditure, and it may be suggested that the addition of one quarter per cent. *ad valorem* to the stamp duty on registered sale, mortgage and other deeds of landed property * would, with the addition of the present grant of about 1 lakh, provide such a sum. In this country, the total cost of stamps and registration on land sales is not above 1½ per cent. and on mortgages 1 per cent., while in Belgium, France, &c., it is 6 to 8 per cent., in addition to which there are succession duties of from 2 to 10 per cent. which, except as stamp-duties on bequests under wills, are non-existent here; the above small addition on land transactions would, if devoted solely to this purpose, provide the cost of a working Agricultural Department, while the amount might easily return a hundred-fold to the ryot.

* Registered transactions in immovable property aggregated just 1,200 lakhs in 1887-88.

197. *Conclusion.*—In brief terms, what seems to be wanted is a Directorate in the Revenue Board, with an Advisory Board, Executive Staff, and District Associations; an executive sufficiently strong and organized to make an impression on public opinion and to feel less hopeless of combating difficulties and problems; district agricultural stations for inquiry, experiment, demonstration and positive improvements; an educational policy based on a wide perception of the needs of the ryot, whether it deals with the ryot direct in schools, or indirectly by training men to teach him, or by the methods of demonstration and stimulation; a policy defined, generous and continuous. Such a department will cost money; within practical limits this is a minor consideration if it be believed with Government and the Board that it is necessary to deal directly with agricultural interests of Indian ryots and that the methods which can be adopted by it are such as will probably result in "benefit to the agricultural community."

MADRAS,
21*st February* 1889.

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APPENDIX D.

THE CIRCULARS AND THE INTERROGATORIES OF THE AGRICULTURAL COMMITTEE.

OFFICE OF THE AGRICULTURAL COMMITTEE,
MADRAS, 26th January 1889.

From

F. A. NICHOLSON, ESQ., C.S.,
Secretary to the Agricultural Committee, Madras,

To (*Vide* next page.)

SIR,

In forwarding, by the desire of the Committee, a series of interrogatories on agricultural matters, I have the honor to request the favor of your replies to such of them as may be answered from your own knowledge, or on which you may have clear and certain information, or may have formulated distinct opinions. The object of the Committee is to obtain on the matters dealt with, a body of indisputable facts and of opinions having the authority of a wide experience.

2. The questions refer chiefly to the matters indicated by Government for inquiry in their Order No. 686, Revenue, dated 25th September 1888, an extract from which is appended for your information.

3. The Committee also request to be informed whether you would be willing to attend and be examined as a witness should it be so desired.

4. The favor of a reply within the 4th February is earnestly requested.

I have the honor to be,
Sir,
Your most obedient servant,

(Signed) F. A. NICHOLSON,
Secretary to the Agricultural Committee.

The Interrogatories of the Committee were forwarded to the following persons and Associations:

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Godávari.

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Principal, Kumbakónam College.

Inspectors of Schools.

All Collectors with five spare copies for distribution (*see page* 168).

INTERROGATORIES.

Seeds.—

(*a*) The necessity for, and the best methods of introducing fresh and exotic seeds;
(*b*) Of supplying good, fresh and first-class seeds of ordinary staples;
(*c*) Of exchanging seeds between districts;
(*d*) Of selecting and pedigreeing indigenous seeds;
(*e*) Of inducing landholders to obtain and use such classes of seed; and
(*f*) Of overcoming any difficulties arising out of indifference or carelessness in the selection of seed.

Implements and Machinery.—

(*a*) The need and opening for new or improved implements as shown by defects in existing implements; the effective demand for them as gauged (1) by inquiries from ryots; (2) by sales; (3) by use subsequent to purchase.
(*b*) The implements required, whether entirely novel or already in use elsewhere; the difficulties in introducing them, the objections raised to them, and the methods of overcoming the difficulties.
(*c*) Implements that have been newly introduced or improved, their success and suitability or the reverse, with reasons for the same.

Cattle, Sheep and Horses.—

(*a*) Defects, with suggestions for improvements in—
  (1) Breeding;
  (2) Management in health and disease;
  (3) Feeding and housing, including the growth of fodder crops and provision of pasturage, private or public;
  (4) Means of combating epidemic disease, with the causes of the spread of disease.
(*b*) The advisability and the functions, organization and *personnel* of a department to deal with the breeding, improvement and distribution of improved stock, and the combating with disease.
(*c*) Existence of large stock-breeders, their number, status, operations and results. What inducements exist for private stock-breeding, and what could be added.

Methods of Cultivation.—The principal needs for and possibilities of improvement in methods, especially in—

(*a*) Fallowing, bare or green.
(*b*) Manures and manuring.
(*c*) Rotation and growth of mixed crops.
(*d*) Irrigation and the economical use of water.
(*e*) After cultivation.
(*f*) Harvesting operations including preparation for market.
(*g*) Special crops, such as cotton, indigo, sugar, &c.

Inducements to Improvements.—The best methods and classes of inducement to improvements, *e.g.*—

(*a*) By exhibitions.
(*b*) By pecuniary prizes (1) at exhibitions, (2) at fairs and festivals, (3) on the field or farm.
(*c*) By honorary rewards and titles.
(*d*) By commercial developments, such as markets, roads, &c.

Exhibitions.—Suggestions for improvement and development in popularity and effect as, for example, by printed leaflets and the appointment of guides for the oral description of exhibits and the encouragement of discussion.

Agricultural Education.—

(*a*) The class of men sent to Saidápet College.
(*b*) The method of their selection.
(*c*) The objects of their being sent or of their application to be sent.
(*d*) The results of their education (1) upon themselves as agriculturists or public servants, (2) upon the progress of agriculture.
(*e*) Elementary education in agriculture, theoretical and practical, (1) in High and Middle schools, (2) in Primary schools, (3) in District Normal schools.
(*f*) Experimental farms and stations; their desirability, objects and usefulness.
(*g*) Educational farms or gardens attached to schools, farm-schools and school-farms.
(*h*) Suggestions for making all classes of agricultural education (1) popular, (2) really practical.
(*i*) Text-books.

Agricultural Inquiry.—Methods, present defects and future development.

Private Effort, Inquiry and Experiment.—

(*a*) Their origin and existence, if any, especially among the richer landholders.
(*b*) Their present and proper direction.
(*c*) The best methods of fostering them.
(*d*) The devotion of capital (1) to new improvements, (2) to the ordinary operations of agriculture.

Agricultural Societies or Clubs.—

(*a*) Their existence, origin, scope, actual operations, success or failure, defects.
(*b*) Suggestions for their origination or improvement, *e.g.*, by affiliation to a central board, bureau or society, by local development, by Government pecuniary aid or other stimulus.

Land Improvement.—

(*a*) Present classes and methods of land improvement.
(*b*) The capital employed whether in money, stored grain or labor.
(*c*) Whether from borrowed or accumulated capital.
(*d*) The methods of borrowing whether (1) from Government, (2) from money-lenders, (3) from lending banks, (4) from loan associations, such as the indigenous class of lotteries, mutual or co-operative loan societies, &c.
(*e*) The interest on borrowed capital and the classes of security offered and accepted.
(*f*) Any objections or hindrances to borrowing from Government, with suggestions for improvement.

Irrigation Wells.—

(*a*) Any special difficulties in digging and working wells.
(*b*) Suggestions for developing well-digging; as, for instance, by the total remission for a term of years of the assessment of the land irrigated.

Other Industries.—

(*a*) The existence, status and present condition of village industries.
(*b*) Suggestions for their improvement and development.
(*c*) The development of new industries suitable to the locality.

(Signed) F. A. NICHOLSON,
Secretary to the Agricultural Committee.

EXTRACT from G.O., No. 686, Revenue, dated 25th September 1888.

* * * *

2. The Committee's inquiries should be directed to the following points:—

(1) What benefit has accrued or is likely to accrue to the cultivating classes from the Agricultural Department as at present constituted?
(2) What improvement it has effected or is likely to effect in seeds, implements, breeds of cattle, sheep and horses and methods of cultivation throughout the Presidency?
(3) What inducements does it hold out to ryots to improve their stock and mode of agriculture?
(4) Its operations in regard to cattle disease, and the benefits resulting from those operations.
(5) The operations in connection with, and the benefits derived from, the stock farm administered by the department—with financial results.
(6) Whether the breeding of stock can be properly or economically carried on by Government.
(7) The duties of the officers employed under the department.
(8) The best means of increasing the efficiency of the department, having special reference to the benefit of the agricultural community.
(9) The course of study pursued at the College of Agriculture.
(10) The class of students at the College and the conditions under which they come to it.
(11) Whether the students engage in agriculture after leaving the College?
(12) Whether the College ought to remain under the control of the Director of Public Instruction?
(13) Whether the Agricultural Department ought to continue to be administered by the Board of Revenue?
(14) Whether the Agricultural Department ought to be restricted to matters connected with agriculture?

OFFICE OF THE AGRICULTURAL COMMITTEE,
MADRAS, 27th January 1889.

From

F. A. NICHOLSON, ESQ., C.S.,
Secretary to the Agricultural Committee, Madras,

To

ALL COLLECTORS.

SIR,

I have the honor, by desire of the Committee, to forward six copies of a set of interrogatories on agricultural matters, and to request that you will favor the Committee with your opinion on the points suggested by the questions at your earliest convenience and, if possible, by the 4th February.

2. Will you kindly distribute the spare copies with the printed letters to such gentlemen as you consider likely to aid the Committee with their opinions? A list of gentlemen in your district to whom copies have already been sent direct is appended.

I have the honor to be,
Sir,
Your most obedient servant,

(Signed) F. A. NICHOLSON,
Secretary to the Agricultural Committee.

APPENDIX E.

A RÉSUMÉ OF THE REPLIES TO THE INTERROGATORIES OF THE AGRICULTURAL COMMITTEE.

Q. I.—Seeds.

(*a*) The necessity for, and the best methods of, introducing fresh and exotic seeds.
(*b*) Of supplying good, fresh and first-class seeds of ordinary staples.
(*c*) Of exchanging seeds between districts.
(*d*) Of selecting and pedigreeing indigenous seeds.
(*e*) Of inducing land-holders to obtain and use such classes of seeds.
(*f*) Of overcoming any difficulties arising out of indifference or carelessness in the selection of seed.

Tahsildar of Ráyadrúg.

(*a*) No actual necessity for this; but it would be useful.
(*b*) No necessity for this, as the ryots, as a rule, use the best seeds available in a taluk.
(*c*). This would be a good thing.
(*d*) No necessity for this.
(*e*) Government should obtain the seeds, keep them at taluk head-quarters and sell them to ryots on credit, the money being collected after the harvest; arrears to be recovered as seed-grain advances.
(*f*) No difficulty whatever.

Tahsildar of Hospet.

(*a*) This is unnecessary.
(*c*) This should be encouraged.
(*e*) The ryots may be left to themselves.

Tahsildar of Hindupur.

(*a*) This is unnecessary, because (1) the experiments hitherto made have ended in failure; (2) it is against custom; (3) there is an absence of local intelligence and enterprise; (4) the inferior grains are consumed more largely and bring in more profit.
(*b*) and (*c*) There is no necessity for either.
(*d*) Gardens or nurseries should be established to demonstrate sound practices, and be easily accessible to the people.
(*e*) and (*f*) The ryots will not depart from their *mamool.*

Tahsildar of Dharmavaram.

(*a*) This would be highly advantageous; this can be best effected by experimental farms.
(*d*) The ryots are generally careful in the selection of seed.

M.R.Ry. Venkata Reddi of Nannur, Kurnool.

(*a*) No necessity for such seeds, as efficient implements are not available, such as ginning machines, &c.; ryots are ignorant of the use of such machines, and should be taught how to use them; it is desirable to extend the cultivation of mokka cholum.

Curnam of Kanchikéra and Reddi of Uchangidrug.

(*a*) This is necessary. The seeds should be supplied only to those who would agree to record and report the results.
(*b*) It is necessary that some one should keep a supply of good seeds for sale to the ryots.
(*c*) This is a good thing.; better if the people do it themselves.
(*d*) Rewards should be offered to ryots who would show a great quantity of grains grown by selection and pedigreeing.

M.R.Ry. P. T. Rajagopalachariar, Deputy Collector, Gooty.

(*a*) The exotic seeds are not suited to this country, as the experiments hitherto made have generally been failures; hence no necessity for them.

(*b*) This is highly desirable.

(*c*) This would be a very good thing.

(*d*) This is also desirable.

(*e*) and (*f*) (1) Government should advance seed-grains instead of money as at present, the amount recovered within the fixed time; (2) seed depôts should be easily accessible to the people. The ryots would be very glad to avail themselves of these facilities, but are too poor to help themselves.

J. Lee-Warner, Esq., Collector of Chingleput.

(*a*) Agricultural societies, private persons or Government (farms) should demonstrate the benefits of the new seeds sought to be introduced.

(*f*) The ryot understands the value of selected seeds; no indifference about the matter.

M.R.Ry. V. Parthasarady Aiyangar, Deputy Collector of Chingleput.

(*a*) No real necessity for exotic seeds, except in some cases; the best way to introduce them is by inducing zemindars and big land-holders to set an example on their own estates.

(*b*) No great necessity for this.

(*c*) This may be advantageous.

(*d*) This is well known to the ryots.

(*e*) and (*f*) Big zemindars and land-holders should set an example for the ryots.

M.R.Ry. V. Bhashikacharlu, Tahsildar of Wálajápet.

(*a*) No necessity for exotic seeds, as there is still great room for improvement in the cultivation of indigenous seeds. The seeds should be distributed to selected persons who have knowledge and interest in the matter; they should be made to cultivate under the supervision of an expert (Government); advantages to be demonstrated to the perception of the ryots.

(*b*) This should necessarily be done, as the ryots do not realise the importance of the subject.

(*c*) There will be much good in this; Government cannot do anything in this direction; private enterprise must lead the ryots.

(*d*) This is necessary.

(*e*) and (*f*) *Frequent* exhibitions should be held in *each taluk*, and fair prizes offered for good specimens. There should be no partiality in the award of prizes.

M.R.Ry. C. Subbramania Reddi, Vakil, Chittoor.

(*a*) and (*f*) Experimental farms should be started at the head-quarters of each taluk, and the best methods of improvements should be demonstrated there; the ryots will then have frequent opportunities of coming there and seeing them.

G. W. Fawcett, Esq., Collector of Trichinopoly.

(*a*) and (*b*) The introduction of a new fodder crop is especially necessary in a district like this where pasture is scanty; the kind suited to the locality should be decided by an expert; patience and persistence are necessary for success.

The superiority of seeds should be practically demonstrated; a supply of such seeds should be brought to their doors; the seeds to be tested before issue. Fodder crops and superior seeds of ordinary staples are as much as can be managed at a time.

M.R.Ry. J. Sreeranga Rajah, Tinnevelly.

(*a*) This is highly advantageous, and in some cases absolutely necessary; for instance, Carolina paddy is more nutritious, more hardy and less aquatic than the ordinary paddy; large areas now left waste for want of sufficient water for country paddy can well grow Carolina paddy. Exotic cotton has a longer fibre.

Agricultural Department should obtain good seeds, and distribute gratis to intelligent and interested ryots; private agency is the best; officials ignorant and uninterested.

(*b*) The ryots understand the value of good seeds, but are too poor to buy them; the ryots should be taught to select good seeds from the best fields; rich ryots should be induced to store up good seeds for the use of poor ryots, or the Government must establish seed depôts at convenient centres for sale at a cheap price or for gratis distribution to poor ryots.

(*c*) The necessity for this should be pointed out by Government, through private enterprise. Perseverance and continuity are necessary to this end.

(*d*), (*e*) and (*f*) Pedigree and selected seeds should be exhibited in exhibitions either by private persons or by Government, and should be distributed gratis to worthy and intelligent ryots at the close of the show.

M.R.Rys. K. Annasicami Aiyar, and A. Somasundram Pillai, Tinnevelly.

(*a*) and (*f*) Experimental farms should be started in each district to demonstrate *ad oculos* the advantages of the improved methods and an agricultural exhibition should be held annually in or about the farm, but the introduction of exotic seeds is premature and unnecessary.

M.R.Ry. Ambalavana Pillai, Tahsildar of Sátúr.

(*a*) The introduction of seeds, which can grow well on poor soils and with little moisture, is necessary.

(*b*) This is necessary.

(*e*) There is necessity for some agency to supply such seeds at the cost price, or help them in obtaining such seeds easily.

(*f*) Some intelligent man in the district or taluk should first set an example.

H. Tremenheere, Esq., Collector of Coimbatore.

(*b*) and (*c*) The Bourbon cotton should be introduced by the personal influence of the district officer and of firms who should give advances on the crops. Generous prices at the agricultural exhibitions should be given for good specimens of wheat. Local Boards should encourage the public and the owners of adjacent lands to plant Casuarina trees by the road-sides by offers of favorable terms.

Tahsildar of Atúr, Salem.

(*a*) The advantages should be demonstrated by experts in important centres of agriculture.

(*b*) This is very desirable. Government should supply such seeds at moderate cost through intelligent village officers.

(*c*) This is indispensable. The above method should be adopted.

(*e*) All that is necessary is to prove the advantages, but the seeds should be supplied at a moderate cost or gratis, with instructions.

(*f*) The ryots should be practically taught in the matter.

Tahsildar of Námakal.

(*a*) (1) Government should demonstrate in the rural farms, established for the practical education of the ryots, the successful cultivation of such seeds; (2) such cultivation should be shown to be financially a success.

(*b*) (1) Government should draw the attention of the ryots either through their officers or by printed pamphlets, freely distributed in the villages, to the existence of such seeds, and obtain them for the ryots; (2) Government must advance good seed-grains instead of money for their purchase.

(*c*) This is also necessary.

Mir Shujaat Ali, Esq., Head Assistant Collector, South Canara.

(*a*) This is necessary.

(1) The ryot should have before his eyes the *example of successful cultivators.*

(2) Pecuniary prizes at fairs and festivals on the field and on the farm, and honorary titles will do much good.

M.R.Ry. D. Ananthayya, Deputy Collector, S. Canara.

(*a*) Seeds of economic value, suited to the locality, should be introduced through the efforts of *private* agency such as cultivators and merchants.

(*b*) Such seeds should be distributed to intelligent and interested ryots in different parts of the district.

(*c*) This would be advantageous.

(*d*) The ryots are quite aware of the importance, and may be left to themselves.

(*e*) In the absence of *private* effort, Government should award prizes for the best crops.

H. M. Winterbotham, Esq., Collector of Malabar.

(*a*) The introduction of exotic seeds has hitherto been a failure.

Secretary, Planters' Association, Wynaad.

(*a*) This is highly necessary.

(*d*) This should be carried out by a Government botanist and gardener, as it requires much skill and attention.

M.R.Ry. K. Raman Unni Nayar, Malabar.

(*b*) This is necessary. The advantages should be proved to the ryots, and such seeds should be within the ryots' means.

M.R.Ry. P. Karunakara Menon, Deputy Collector, Malabar.

(*a*) This is highly desirable; the best way is for Government to obtain and distribute such seeds *gratis*.

(*b*) No pressing necessity.

(*f*) Exhibitions and rewards are the best methods.

M.R.Ry. V. Chappu Menon, Deputy Collector, Malabar.

(*a*) This can best be done through taluk experimental farms, managed by a committee, consisting of Tahsildar and influential ryots.

(*b*) This is more important.

(*e*) and (*f*) This can be effected through the successful working of the Taluk Committee, suggested above.

Ryots' Association, Madanapalle.

(*a*) The introduction of fresh and exotic seeds, desirable; the best way is to give them to big ryots having leisure and means to experiment.

(*c*) Desirable.

(*d*) Practised to a little extent; can be extended when the people see the advantage.

(*e*) and (*f*) Every one will be glad to get such seeds; offer small rewards for superior produce of such seeds.

T. Ward, Esq., Madanapalle.

(*a*) The introduction of exotic seeds, desirable; will improve the status of ryots.

(*b*) and (*f*) Could be done through the "Ryots' Association."

M.R.Ry. C. Hanumanta Goud, Hospet.

(*a*) No great necessity to introduce exotic seeds; the utility to be demonstrated to the perception of the ryot.

(*c*) Advantageous one.

(*d*) Practised to a little extent.

(*e*) and (*f*) No difficulty in inducing ryots to use such seeds.

Rev. E. Lewis, Bellary.

(*a*) There *is* a necessity, but the ryots are prejudiced against novelty; the best way would be to get the men who customarily sell seed-corn to the ryots to sell fresh seeds and to recommend them to the notice of the ryots.

(*b*), (*c*) and (*d*) Induce the men who now sell seed-corn to make the best selection of indigenous seeds, and also to get good seeds from other districts.

(*e*) and (*f*) The value of selection and change of seeds, &c., should be explained to a number of important ryots, say, at jamabandy time, every year, by a person well up in agriculture and interested in the grains of the district.

M.R.Ry. P. Subba Row, Anantapur.

(*a*) No necessity for exotic seeds, which are most probably unsuited to indigenous conditions.

(*e*) The Government should procure a supply of best seeds, and distribute for one or two years to ryots who have the means and knowledge to grow them. Government should also grant rewards or titles to persons who produce the best sorts.

(*f*) Prizes and honorable titles are the best means available; but much depends upon the personal influence of the local officers.

Hon. S. Subramania Iyer, B.A., B.L.

(*a*) No reply.

(*b*) It is of primary importance; seeds to be kept available for distribution to a limited extent at the head-quarters of the Tahsildar or Deputy Tahsildar.

(*c*) This is also very important; would certainly be beneficial.

(*d*) This is desirable.

(*e*) (1) The seeds distributed should be suited to the locality; (2) the Deputy Tahsildar, Tahsildar and the higher Revenue officers should be induced to take a personal interest in the matter; (3) intelligent ryots should be selected and supplied with seeds sufficient for one acre; (4) this should be done persistently in various parts of the country.

(*f*) No reply.

M.R.Ry. P. Rangiah Naidu.

(*a*) and (*f*) There is no necessity for the exchange of seeds between districts, as the local varieties are well suited to existing conditions.

M.R.Ry. P. Theagaroya Chettiar.

(*a*) and (*d*) There appears to be no necessity for exotic seeds in the districts surrounding Madras; but as these districts are deficient in water-supply, it would be well to try exotic seeds, maturing earlier on a less quantity of water.

(*e*) and (*f*) Generally ryots take some care in the matter, and there appears to be no necessity for offering any special inducements.

J. Steavenson, Esq., Madras.

(*a*) and (*f*) Good and sound seeds are most important. The ryot understands the value of picked seeds, &c., but being oppressed by poverty is unable to take advantage of opportunities. If means could be devised, through the village suppliers or the village officers, of placing within the ryots' reach good, fresh and first-class seeds of ordinary staples, ryots would certainly appreciate them, and need little inducement to use them.

Dewan Bahadur R. Ragoonatha Row, Madras.

(*a*) and (*f*) There is no absolute necessity for the introduction of fresh and exotic seeds, but it may be tried; the best way is to obtain really good seeds and distribute them to large landholders to try them and report the result.

M.R.Ry. C. Ramaswami Reddi, Vellore.

(*a*) and (*f*) Experimental farms should be established in one or more principal stations in every district to demonstrate and to effect any improvements in seeds.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

(*a*) Local inquiry must precede introduction; the advantage of the exotic seeds to be demonstrated at the expense of Government to the perception of the ryot before it could succeed.

(*b*) This is very important: not possible for Government to take the initiative in the matter; improvement must proceed from the people themselves who well know the value.

(*c*) The people understand well this matter, and Government aid unnecessary; but Government should give due publicity to the advantages of the cultivation of any special seed.

(*d*) Improvement in this matter can come only from the efforts of the people of means and education, who should adopt agriculture as their calling.

(*e*) (1) The Revenue officer should explain to the ryots the utility of using good seeds; (2) the assessment on a certain area may be reduced if the ryot agrees, to devote that amount to keep up the pedigree of seeds.

M.R.Ry. Narainasami Nainar, Gingee, South Arcot.

(*a*) The ryots should be taught how to prepare seed-grains properly.

(*d*) The seed-grains should be soaked in water, and those that sink should be generally selected as the best.

(*e*) The utility of using fresh seeds should be brought home to the minds of the ryots.

(*f*) The best methods of selecting seeds and the amount of loss arising out of neglect in the matter should be impressed on the people as often as possible.

M.R.Ry. K. Veeriah Vandiar, Poondi, Tanjore.

(*a*) No necessity for exotic or fresh seeds; the country affords the best seeds of all grains; the utility of exotic seeds to be demonstrated by Government, before the ryots can be induced to adopt them.

(*b*) No necessity for this; the local market amply supplying all wants.

(*c*) Not the least necessity for this, unless Government can demonstrate the superior advantage of the seeds received in exchange.

(*e*) No necessity.

(*f*) The ryots take the best care in the selection of seed-grains, and may be left to themselves.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector of Madura.

(*a*) No necessity at present for fresh and exotic seeds.

(*b*) This is desirable, as the ryots are very indifferent about the matter.

(*c*) Generally the ryots do this, if they find it to their advantage. Government aid unnecessary in this direction.

(*d*) and (*e*) Not necessary; ryots may be left to themselves.

(*f*) The ryots are, of course, careless; but time and education alone can develop a sound practice. Government cannot act directly on the ryots' practices.

M.R.Ry: A. P. Thandavaroya Pillai, Aiempoliem, Trichinopoly.

(*a*) No necessity at present for either fresh or exotic seeds.

(*b*) The best way is for Government (1) to advance good seeds to ryots and recover them in kind; (2) or to sell them at a moderate price, and recover the amount with the kist in convenient instalments.

(*c*) No necessity at present.

(*d*) and (*e*) The ryots must be made to understand the utility of the practice.

(*f*) (1) Seed depôts must be established for each group of villages in a taluk, and must exchange good seeds for bad one (the difference in value being collected and credited to Government); (2) the seeds to be tested before issue.

M.R.Ry. T. Ranga Row, Deputy Collector of Madura.

(*a*) The necessity for introducing exotic seeds can be established only by demonstrating their utility. The methods can be suggested by specialists only.

(*c*) This is necessary in a few cases; exchange of seeds between Presidencies is desirable.

(*e*) The ryot is most willing to obtain and use selected seeds.

(*f*) The ryot does his utmost to secure the best seeds, and there is certainly no indifference or carelessness about it.

M.R.Ry. M. R. Ramakrishna Aiyar, Tinnevelly.

(*a*) Fresh and exotic seeds, suited to the country, are highly desirable, *e.g.*, the country cotton fibre is short, coarse and weak; exotic cotton matures earlier, yields heavier and finer produce, and is better able to withstand droughts; so also with tobacco, Carolina paddy, wheat, &c. As to the methods: (1) District experimental farms should be started for demonstration; (2) experiments should also be made by ryots under proper supervision; (3) district farms should be seed depôts; (4) an expert should travel through the country, learn native practices and their *rationale*, and give advice: an officer of Mr. Benson's experience should be sent to America, &c., to learn the best methods of cultivation of exotic seeds, &c., so as teach the Indian ryot; (5) Government should supply good and cheap seeds; (6) a temporary reduction of assessment should be made on the area grown with fresh or exotic seeds.

(*c*) Full information as to the conditions, the habits and the advantages of the seeds elsewhere grown, should be collected and published in the chief vernacular languages.

(*e*) and (*f*) The ryots, no doubt, take care that they do not use bad grains for seed; but no selection is practised.

M.R.Ry. S. Sesha Aiyangar, Nagercoil.

(*a*) Fresh and exotic seeds, suited to the existing conditions, should be obtained by Government and distributed to the ryots for cultivation.

(*b*) Such seeds should be obtained and distributed to the ryots through zemindars and large land-holders.

(*c*) The advantages, &c., of the seeds grown in each district should be published in the District Gazettes.

(*d*) Central and Branch Committees should be appointed to select and classify seeds according to their pedigrees.

The above things are all necessary objects to be attempted.

(*e*) No difficulty about this: Government should start seed depôts, and sell such seeds to ryots who would willingly pay and buy.

(*f*) The chief officers should induce and encourage the ryots, chiefly the Native Princes, the zemindars, and the big land-holders.

M.R.Ry. Perumal Mudaliar, Alwarkurichi, Tinnevelly.

(*a*) Exotic seeds, suited to the locality, should be distributed to the ryots through Tahsildars, with leaflets, treating fully about the methods of their cultivation, uses and profits, &c.

(*d*) If Government should supply selected seeds to ryots at a moderate price during cultivation season, the ryots will learn from experience the advantages of the practice and will themselves readily learn and adopt the best methods of selection.

(*e*) The seeds should be distributed either gratis or at a moderate price; their cultivation should be supervised by a competent person, and small rewards should be given for the best crops.

M.R.Ry. Ganapathi Pillai, Manager, Etaiyápuram.

(*c*) Government should encourage the people to import such seeds from other districts at least in the beginning, or until the people have learnt the necessity or the methods of supplying themselves.

(*f*) The ryots are careless, beyond description, in the selection of seeds; advice and examples by persons of good agricultural education, who take to farming, can best overcome the difficulties.

M.R.Ry. Bashiakarlu Naidu, Coimbatore.

(*a*) American maize, cotton and tobacco may be introduced with advantage, for exotic cotton yields heavier, tobacco produces excellent leaves, &c. Intelligent ryots and respectable officials should try them and report the results.

(*b*) No necessity for this, as the ryots are careful enough in the matter.

(*c*) This is done at present; no aid necessary.

(*d*) This should be done, if at all, by Government; but may be postponed to some future time.

(*e*) Government should offer small rewards for best crops.

(*f*) This should be the work of time.

Pattagar, Palayakottai, Erode.

(*a*) This is necessary.

(*b*) It is necessary to supply the ryots with such seeds.

(*c*) The Government should do this, as the ryots have great difficulties in the matter.

(*d*) This is also necessary.

(*e*) It is necessary to induce the ryots to use such seeds.

General Morgan, Secretary, Planters' Association, Ootacamund.

(*a*) This is highly desirable; a system of exchange should be established with the Botanical Gardens in the various parts of the world.

(*b*) Proper manure is a pre-requisite for the introduction of improved varieties.

(*c*) This is a very important matter.

(*d*) and (*e*) Do. do.

(*f*) The ryots would generally welcome any assistance in the selection of good seed.

Dr. J. Shortt.

(*a*) The seeds should be obtained from the best growers in Europe, &c., and should be freely distributed, but on a very much larger scale than has hitherto been done.

The supply must be constant, if it is to effect any improvement.

(*c*) This is a very valuable plan, and should be persistently carried out.

(*d*) It is yet too early to attempt in this direction, but a constant succession of fresh seeds will naturally lead the ryot to such a practice.

Secretary, Shevaroy Planters' Association.

The best way to improve native agriculture is to induce Europeans to take up lands by offering them favorable terms.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

(*a*) Indigenous seeds have deteriorated; fresh and exotic seeds necessary. Full information as to their cultivation should be disseminated among the ryots and the revenue inspectors through publications, to create an interest in the matter. The district farm should set an example for the ryots and supply cheap seeds to willing, intelligent ryots. Revenue officers should supervise and encourage such experiments.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

(*a*) In-breeding has caused deterioration and new seeds should be introduced.

(1) Government or aided seed depôts are desirable and should offer fresh seeds at the lowest price, if not gratis.

(2) Areas cultivated with fresh seeds may get remission.

(3) But improvement of general conditions and practices are essential to permanent development.

M.R.Ry. P. Basavanna Goud, Patel of Amidali.

(*a*) Exotic tobacco and cotton seeds supplied by Government and Mr. Sabapathi Mudaliar are inferior. It is desirable that Government should supply good and first-class seeds.

(*b*) Unnecessary at present, as ryots themselves preserve good seeds.

(*c*) Only paddy seeds are exchanged between districts and not others.

M.R.Ry. Venkata Reddi, Narnur, Rámallakót.

(*a*) There is no use of exotic seeds, such as cotton, in the absence of proper machinery (as gins). First introduce the machines and teach the people how to use them. Mokka-cholum seeds may be supplied on a small scale.

(*b*) Describes in detail the best process of preserving seed-grains.

M. R. Weld, Esq., District Judge, Ganjam.

(*a*) Darangabadi in the Ganjam Maliahs, situated on a spacious table-land, would be an excellent field for growing wheat, European fruits and vegetables, &c., if the Khonds could be induced to take to agriculture, or if arrangements could be made under which land could be acquired by other people at that place; but supplying the Khonds with weavil-eaten seed which declines to germinate is not the way to get them to take to new products.

M.R.Ry. C. K. Subba Row, Sub-Assistant Director of Agriculture.

(*a*) It is worth introducing Carolina or Madagascar paddy, New Orleans cotton, maize, amber sugar-cane and common wheat. Carolina paddy is much less aquatic than the country paddy; exotic cotton is much more paying under high farming than the indigenous variety. Maize is more productive and nutritious than most other cereals. Amber sugar-cane matures earlier (3½ months) and yields fine jaggery, a red dye and very agreeable fodder for cattle; it can be grown like cholum. Madagascar paddy is successfully cultivated in Tinnevelly. The seeds should be first obtained and cultivated in the experimental farms. The ryots may then be encouraged to propagate them by Government offering pecuniary prizes on the field.

(*b*) Good seeds for ordinary staples should be obtained from places where they thrive best and cultivated in a Government model farm; the seeds produced there should be distributed to ryots at cheap prices.

(*c*) Exchange between *districts* is not necessary; it is enough if the owners of different lands in the same village or taluk exchange their seeds.

(*d*) A duly qualified agriculturist should be sent about the harvest time to explain to the ryots the advantages of selecting and pedigreeing seeds and teach them how to do it practically.

(*e*) By example on a model farm and by pecuniary prizes on the field.

(*f*) Supervision by officers of the Agricultural Department.

M.R.Ry. Nataraja Pillai, South Arcot.

(*a*) Fresh and exotic seeds suited to this country are highly necessary. The Government should obtain them for the ryots, remit the assessment on the land cultivated with them and offer prizes at exhibitions for seeds produced from them.

(*c*) Government should notify in papers the places where, and the persons from whom, the best seeds could be procured, and this will facilitate exchange.

(*e*) The advantages of selected seeds should be made known by means of lectures and tracts.

M.R.Ry. N. Vasudeva Row, a Ryot of Nellore.

(*a*) Successful cultivation in district experimental farms is the best method of introducing exotic seeds.

(*b*) The ryots generally reserve the best portion of their crop for seeds; the supply of fresh seeds is therefore uncalled for.

Q. II.—Implements and Machinery.

(*a*) The need and opening for new or improved implements as shown by defects in existing implements; the effective demand as gauged—

(1) by inquiries from ryots;
(2) by sales;
(3) by use subsequent to purchase.

(*b*) The implements required, whether entirely novel or already in use elsewhere, the difficulties in introducing them, the objections raised to them and the methods of overcoming the difficulties.

(*c*) Implements that have been newly introduced or improved, their success and suitability or the reverse, with reasons for the same.

Tahsildar of Ráyadrúg.

(*a*) and (*b*) Existing implements good enough and new ones not required or cared for; superiority of new ploughs admitted; prime cost and difficulty of repairs prevent introduction.

(*c*) Fifty sugar-mills and 200 to 300 iron ploughs sold to better class of ryots. Some ryots hire sugar-mills from the purchasers. Ploughs must be cheapened and repairs simplified. Blacksmiths to be trained.

Rev. E. Lewis, Bellary.

(*a*) Sugar-cane mills approved.

(*b*) Iron ploughs universally objected to as costly and difficult to repair; use *gratis* has been refused. Failure to grow a better crop has produced distrust; only a few are used by ryots near towns: some have bought, but have thrown them aside.

Tahsildar of Hospet.

II.—Defects in existing implements known to the ryot, but the new implements cannot be repaired, and pressure of family needs in an increasing population forbid costly purchases.

M.R.Ry. C. Hanumanta Goud, Hospet.

(*a*) Sugar-mills a proved success; has sold 600 in four years.

(*b*) A good and cheap oil-mill is much required; also a good irrigation pump. Inferior imitations of sugar-mills are being made to sell and not to work, and the ryot should be protected lest the good mills fall into disrepute.

(*c*) Is introducing an American evaporator for sugar.

Karnam of Kenchikera and Reddi of Uchangidrug.

(*a*) Good iron ploughs promote quick and deep cultivation; threshing and winnowing machines would be economical; seed-drills may be improved.

(*b*) But improved implements are costly and hard to repair; ploughs purchased on official suggestion are not even in use.

(*c*) Some ploughs introduced in three taluks by Mr. Sabapathi Mudaliar's efforts, but not in other taluks.

Great demand for iron sugar-mills which have ousted the wooden mill in Hospet, owing to ease in working and improved outturn.

Tahsildar of Dharmavaram.

(*a*) Improved implements not offered or demanded by the ryot. Improved implements desirable, but must be cheap and easily repaired; would then be acceptable.

M.R.Ry. P. T. Rajagopalachariar, Deputy Collector, Gooty.

(*a*) *and* (*b*) General implements sufficient, except the plough. Turn-over, quick-acting ploughs desirable, but costly and difficult to repair; would, therefore, prefer an improvement in the country plough which the village smith could make and repair.

Tahsildar of Hindupur, Anantapur.

(*a*) Existing implements believed to be good enough; one experiment was a failure.

(*b*) Iron ploughs costly, difficult to repair and not made known to the ryots; not haulable by common cattle.

M.R.Ry. P. Subba Row, Anantapur.

(*a*) Present implements suitable for local hard soils.

(*b*) The new ploughs do not go deep enough.

Ryots' Association, Madanapalle, Cuddapah.

(*a*) Demonstration of improvements by comparison with existing implements is necessary. Ploughs, winnowers, evaporators should be sent for lengthy trial by the association.

(*c*) Beheea sugar-mill is a success here.

T. Ward, Esq., Madanapalle.

(*a*) Improved implements not in demand; cheap ploughs, winnowers and evaporators desirable.

(*c*) Beheea sugar-mill is a success here.

Tahsildar of Wálajápet.

(*a*) Would introduce such improved implements, such as turn-over ploughs; costly machinery not suitable.

(*b*) Objections are the draught, cost of improved ploughs and their unsuitability for wet land; even those bought are not utilized. Mere casual lectures about implements are useless; there must be a local officer practically to demonstrate and advise.

M.R.Rys. C. Ramaswami Reddi, Vakil, Vellore, C. Subbramania Reddi, Vakil, Chittoor.

(*a*) Implements in use in the north of the district require no change.

Rev. J. E. Clough, Nellore.

(*a*) Great need of improved implements, chiefly for deep cultivation. No demand at present; that must arise out of demonstration.

Tahsildar of Námakal.

(*a*) Ploughs, sugar-mills, and water-lifts are defective; the two former have been improved, the last has not.

(*b*) Swedish ploughs unsuitable, being too heavy; cheap, light and strong plough has yet to be introduced. Defects in country ploughs should be pointed out to ryots and the *final* profits of improved ploughs should be *demonstrated*.

Dr. J. Shortt, Yercaud.

(*b*) The department has done good work with regard to implements which must be cheap, useful, and strong and continuously and patiently placed before the ryot.

Tahsildar of Atúr.

(*a*) A light, cheap, quick-acting plough is required.

(*b*) Country ploughs are preferred by ryots, because improved ploughs are costly, difficult to repair, and believed to be greater in draught; the last objection is incorrect.

Pattagar of Palayakottai, Erode.

(*a*) It is necessary to improve the existing implements after ascertaining their defects. Good water-lifts are needed.

(*b*) A cheap water-lift, within the reach of poor ryots, would be useful.

M.R.Ry. J. Bhashiakarlu Naidu, Coimbatore.

(*a*) Existing native ploughs answer all local needs. Strong iron ploughs not required. Refusal of such ploughs not due to want of means, but because they are not wanted. Ploughs have been bought to please officials and are lying idle.

(*b*) Improved sugar-mills are in demand and are ousting the old mills. The only objection is their high cost. Rich people buy and hire them out at 10 to 12 annas per day. Government might let them out at cheaper rates. A wooden mill in 24 hours produces 250 lb. of jaggery, the iron mill with higher bullocks produces 500 lb. in 12 hours.

Secretary, Planters' Association, Nilgiris.

(*a*) Cheap improved ploughs are becoming appreciated. No sub-soil plough has yet been introduced. Cost of implements has sometimes caused failure.

Messrs. Massey and Co., Madras.

(*a*) Native ploughs give results incommensurable with the power and time expended, several unnecessary ploughings being required; hence loss and expense to the ryots. Demand for new ploughs limited, but progressive when introduced. Some ploughs, though bought, are not used owing to want of knowledge, indifference and conservatism.

(*b*) Implements demanded are of novel pattern and require to be specially designed to suit the ryots. All sorts of objections have been raised, chiefly prime cost, weight, draught, difficulty of repair. Cost and weight are now low, draught less than that of the wooden plough per unit of work, repairs of wearing parts rendered easy to village smiths; the remaining difficulties are those of introduction and the objections of the village artisans. Travelling shows useful, but of too limited duration in each place. A small area should be selected for complete demonstration throughout a season.

(*c*) Improved ploughs and sugar-mills have been successfully introduced; nothing material in water-lifts which are complicated and costly.

Messrs. Oakes and Co., Madras.

(*a*) Cheap and effective oil-mills are frequently inquired for; if a suitable mill were introduced, it would be much in demand.

J. Steavenson, Esq., Madras.

(*b*) Believes from experience that poverty prevents the cheapest plough from being bought and used with the miserable cattle available.

Dewan Bahadur R. Ragoonatha Row.

(2) New implements to be successful must be cheap, easily repaired, and manufactured close to the village.

M.R.Ry. P. Theagaraya Chettiar, Madras.

(*a*) Existing ploughs are good; slight improvements desirable.

(*b*) Forest rules have made ploughs comparatively costly, as the wood has now to be paid for. They are, however, cheap as compared with improved ploughs which are too costly for the ryot. A few have been purchased, but are not used owing to difficulty of repair. A plough's maximum cost should be 2 or 3 rupees, to be drawn by ordinary bullocks. Other machines unnecessary. A better water-lift than the present, if invented, would be appreciated.

Hon'ble S. Subbramania Iyer.

(*a*) and (*b*) Considers the introduction of a few improved implements necessary; improved ploughs are admittedly superior, but present cost is prohibitive; Rs. 3 should be the maximum. Drills, winnows, &c., unknown in the South; if made cheaply, will be utilized. A suitable plough for wet cultivation has not yet been invented. Cheap drills and ploughs should be on show at all taluk offices.

M.R.Ry. P. Rangiah Naidu, Zemindar, Chingleput.

(*a*) Poverty prevents the use of new ploughs. Forest action has doubled or trebled the price of country plough, which, however, does not exceed Rs. 1-4-0. The only desirable machine is an improved water-lift.

(*b*) Premiums should be offered for cheaper improved ploughs repairable by the village smith and haulable by ordinary cattle.

J. Lee-Warner, Esq., Collector of Chingleput.

(*a*) The native plough has done good work for centuries, cheap and easily procurable. Value of turn-over ploughs in the tropics has yet to be proved. Oil-mills, winnows and cane-crushers may eventually be useful, but never universal.

M.R.Ry. V. Parthasaradhi Iyengar, Deputy Collector, Chingleput.

(*a*) and (*b*) English ploughs acknowledged to be superior by all intelligent ryots, but they do not care to introduce them; poverty and conservatism are the great obstacles. Rich ryots must set the example. Mere lectures and publications are useless.

M.R.Ry. Narainasami Nainar, Gingee.

(*a*) Improved ploughs are necessary to obtain desirable deep tillage. Winnows, reapers and other machines are desirable.

(*b*) Present improved ploughs suit light soils, but not stiff ones, in which the blocks of earth become solidified by the heat.

(*c*) New sugar-cane mills have been successful.

M.R.Ry. E. Muthukomarappa Reddiar, Iruvelipat, Tirukoilúr.

The improved ploughs are useful; they plough much deeper and wider than the country ploughs. Besides, the land is thoroughly broken up in two ploughings alone. The land cultivated with the iron ploughs yield more. If they were slightly reduced in draught and made somewhat cheap, most people in the district would buy and use them.

M.R.Ry. S. Devanayagam Mudaliar of Cuddalore.

(*a*) and (*b*) Considers that improved ploughs and sugar-cane mills are approved of. Ploughs, however, are not much used, because of (1) heavy draught, (2) unsuitability for seed-sowing and wet cultivation; good cattle are the remedy for the first; variety of implements for the second.

H. Sewell, Esq., Collector of South Arcot.

(*a*) A few ploughs have been bought, chiefly by the persuasion of Tahsildars; few have been used.

(*b*) Cost is not the objection, but the heavy draught when ploughing deep; is not sanguine as to the general introduction of such ploughs.

M.R.Ry. K. Veeriah Vandiar, Pundi, Tanjore.

(*a*) The present implements are quite sufficient.

(*b*) The profitableness of improved implements must be demonstrated before they will be used; different soils and conditions require different implements. Weight, draught and cost are against the new ploughs. Even those bought are not used.

M.R.Ry. A. P. Thandavaraya Pillay, Mirassidar, Ayampoliem, Trichinopoly.

(*b*) Objections are raised to the improved ploughs, viz., cost, draught, short yield.

G. W. Fawcett, Esq., Collector of Trichinopoly.

(*a*) Improved implements are necessary, but are not in demand.

(*b*) Ploughs are bought to please officials and not for use; but they will be bought and used if the superiority of an implement is *proved* and to his perception. Demonstration is, however, necessary, for the ryot himself cannot afford experiments and will not accept hearsay statements. Superiority connotes relative cheapness, durability, increased crop-yield, suitability to local conditions; such superiority (1) is essential and (2) must be conclusively demonstrated. Another obstacle is that well-to-do land-holders do not themselves cultivate, but lease to pauper tenants usually on the *metayer* system; hence the actual cultivator is inferior and starved. The actual farmer has no capital and the capitalist does not farm; it is the latter class that must be dealt with.

Good ploughs are rejected on the report of a single trial by a Pallan who is the practical arbiter in cultivation, though densely ignorant and indifferent to all change since all the benefit would go to their master. Capitalist ryots, such as Messrs. Krishnasami Mudaliar of Shiyáli and Sabapathy Mudaliar of Bellary, have led the way; if there were such men in each district, the difficulty would be over. Believes, therefore, that large landholders should be stimulated to experiment and to adopt improvements, though he is aware that Mr. Krishnaswami Mudaliar's example has not been followed. Demonstration, however, should be through the ryots themselves, as such proof is the only one which will be accepted.

Does not believe there is any genuine objection to the ploughs except their expense. Points out that objections to innovations have been raised and decided in other countries besides India, as in the progress of English and Continental agriculture.

(*c*) Considers that ploughs formerly supplied were too flimsy owing to undue attention to vain objections.

M.R.Ry. T. Ranga Row, Deputy Collector, Madura.

(*a*) For dry cultivation, new ploughs are superior; in wet they are not. Draught and repairs are removable obstacles. A simple seed-drill is urgently wanted. A simple thresher as exhibited in Madura would be in demand. An efficient and cheap water-lift is a most urgent need, neither the single or double mhote being satisfactory.

(*c*) Sugar-mills are already successful.

J. Thomson, Esq., Collector of Tinnevelly.

(*b*) The chief objection to improved ploughs is the want of good cattle; this again is due to the fact that well-to-do ryots usually lease their lands to pauper cultivators. Profit, moreover, must be distinctly demonstrated.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector, Madura.

(*a*) Improved ploughs are necessary, but are not at all in demand; those purchased were ordinarily not for use, but were bought to please the Tahsildar, who thought to please the Collector.

(*b*) Cost and difficulty of repair are objections to the new ploughs; the native plough costs little but labor; the draught is also too much for the small cattle. The better class of ryots cannot plead such excuses; the obstacles here are conservatism and the absence of demonstration. Objection is also raised to the method of ploughing; in the native method each bullock walks alternately on the ploughed and unploughed portion; new ploughs should be adaptations of native ploughs. The attempt to introduce heavy Swedish ploughs was a mistake and unfavorably prejudiced the ryots. Deep ploughing is known and practised, provided the rains continue long enough.

M.R.Ry. M. R. Ramakrishna Iyer, Tinnevelly.

(*a*) (1) and (2) Defects in the native plough are (1) the small amount of work done compared with labor, (2) the length of time taken. Different ploughs, however, are required for different soils, *e.g.*, turn-over ploughs do not suit wet lands and red soils if they plough below 5 or 6 inches; otherwise the defects of native ploughs are got rid of by European ploughs, which also prevent the scamping of work by ploughmen. Further discusses various precautions to be observed with the new ploughs; suggests further experiments to ascertain whether the new ploughs can produce the fine surface tilth effected by the native plough. Believes that the use of grubber may suffice for light and open soils. Disbelieves in the European plough for the black soils, whether for breaking them up or for clearing them from weeds. About 200 improved ploughs were recently sold in the district; hears that the work was approved of, but that the shares wore rapidly out. Native seed-drills with any improvements should be shown. A good water-lift would be in demand, *e.g.*, a simple wind-mill which could be driven by bullocks in the absence of wind.

(*b*) There should be travelling shows, ploughing competitions and demonstrations at cattle-fairs.

The only objection to the new sugar-mill is the difficulty of repair.

M.R.Rys. K. Annaswami Iyér, Mirassidar, A. Somasundram Pillai, Mittahdar, Tinnevelly.

(*a*) Improved implements need not be introduced; the ryots will do that for themselves if the experimental farm is successful in its demonstration.

M.R.Ry. R. M. Ambalavana Pillai, Tahsildar of Sátúr, Tinnevelly.

(*b*) English ploughs are objected to as being costly, difficult to repair and heavy in draught; the last objection disproved by trial; smiths should be taught to repair.

M.R.Ry. Perumal Mudaliar, Alwarkurichi, Ambásamudram.

(*a*) Many of the existing implements are unsatisfactory and do not act rapidly. Some ryots in the district are using English ploughs, being aware of their superiority. He himself has been

using 10 English ploughs for the last six years. Sugar-cane mills, water-lifts, rice-hulling machines, seed-drills and others would be useful.

M.R.Ry. K. Raman Unni Nayar, Malabar.

(*a*) Necessity for improvement is admitted.

(*b*) But heavy ploughs demand better cattle and better carpenters and smiths; has tried two ploughs, both were unsuited for the above reasons; but the crops produced were better than the surrounding ones.

M.R.Ry. V. Chappu Menon, Deputy Collector, Calicut.

(*a*) Present ploughs defective, having no mould-board or means of regulating the furrow; an improved plough would be successful, if its superiority were established beyond doubt. There is no present demand for it.

(*b*) No strong objection to improved ploughs except the price; this objection might be overcome by demonstration.

(*c*) Swedish ploughs were never properly tried.

M.R.Ry. P. Karunakara Menon, Deputy Collector, Malabar.

(*a*) Light and cheap ploughs should be widely distributed.

Mir Shujaat Ali Khan, Esq., Head Assistant Collector, South Canara.

(*a*) Endeavoured to introduce ploughs, but found there was no genuine demand; ryots offered to buy if he wished, but admitted that they would not use them.

M.R.Ry. J. Sriranga Rajah, Tinnevelly.

(*a*) Mentions the defects of the country plough and assures the advantages of the improved plough. Mentions the present conditions of Indian farming, especially modern difficulties. For the adaptation of new ploughs, their value must be thoroughly demonstrated by field experiments, especially on well-managed farms. The implements required are principally ploughs, cultivators, drills, sugar-cane mills. Modifications of native tools will be more useful than regular European implements. Suggests very light draught ploughs with small mould-boards of very low cost, similar in appearance to the country plough, single-stilted, light in weight, durable and capable of good work.

M.R.Ry. N. Ganapathi Pillai, Manager, Etaiyápuram Estate.

(*a*) The only implements known in Tinnevelly are the plough, mamoty and sickle; ryots will, however, adopt other instruments if positively proved to be profitable.

(*b*) The only difficulty is in the demonstration. A Government stock might be kept for letting out to the ryots.

M.R.Ry. D. Ananthaiyer, Deputy Collector, South Canara.

(*a*) Improved implements desirable, but not demanded. Improved ploughs, water-lifts and sugar-cane mills are needed. The Beheea sugar-cane mill, which has been a great success in Bellary, has not been shown to the Canara grower.

(*b*) The objections are cost and difficulty of repair. New ploughs have hardly been introduced or their value demonstrated; if demonstrated to satisfaction, they will be largely used.

M.R.Ry. S. Sesha Aiyangar, Nagercoil.

(*a*) Improved implements, undoubtedly necessary to remedy the defects of existing implements. An effective demand exists as gauged by personal inquiries and experience by the sale of 500 ploughs during Sami Aiyangar's travelling show of 1884 and by the subsequent use ploughs, known as "Sami Aiyangar." Will send written statements from the ryots.

(*b*) Implements required entirely novel to this Presidency. The introduction of innovations is very difficult, but the difficulties might be overcome—

(1) An intelligent ryot should be made to exhibit the working of the plough and to explain its advantages; lectures should also be given.

(2) Improved implements should be distributed *gratis* to one or two persons.

(3) The defects of existing ploughs, piece by piece, should be explained side by side with the immense advantages of improved ploughs.

He undertook a plough exhibition tour in parts of Tinnevelly district in 1885 and had in this way overcome the difficulties.

(*c*) Sami Aiyangar's iron ploughs and Massey's ploughs have been successfully introduced; they turn out thrice the quantity of work done by native ploughs; plough deeper and wider, act rapidly, turn over greater quantity of earth.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

(*a*) New or improved implements would be very advantageous, but the ryots are too poor, cattle too weak and village smiths too ignorant. Free supply of wood from village jungles (see Question III—3) or Government forests would do much good. The district farm should first set an example.

M.R.Ry. P. N. Subbramania Ayar, Dindigul.

(*a*) and (*b*) Draught and expense are against the use of improved ploughs. Sugar-mills are not in demand, being costly. Good cattle are not purchased, because of the difficulty in maintenance and because the ryot is not sure of the security of landed property under the present land revenue system. Hence demonstration tours are useless.

M.R.Ry. Basavanna Goud, Patel, Amiddki Village.

(*a*) Country plough costs time and labour, as the fields have to be reploughed. The Swedish and American ploughs (which he is now using) save much time and labour. All the ryots are willing to buy and use the new implements.

(*b*) The only difficulty is that of local repairs; the ryots are obliged to take their ploughs to Bellary, 33 miles off, at great cost and trouble. The cost of the ploughs places them beyond the reach of poor ryots.

(*c*) The ploughs purchased are now in use; but much difficulty is felt in the way of repairs.

M.R.Ry. Vencata Reddi, Narnur, Rámallakót.

(*a*) and (*b*) The country ploughs are too heavy and act with difficulty. The improved ploughs act easily and go deep, hence absolutely necessary; but the prime cost and the difficulty of repairing are against their general use. Village smiths should be taught how to repair the new implements and should be supplied with the necessary instruments. Moreover, the improved ploughs are not suited to hard and rocky soils.

M. R. Weld, Esq.; C.S. Ganjam.

(*a*). and (*b*) The advantge of *turn-over* ploughs is yet to be demonstrated; if advantageous, the best plan would be to adopt a mould-board to the country plough.

Expensive ploughs, water-lifts are no use to ryots, as they soon get out of order and cannot be repaired.

Considers that in sandy soil, where pits are easily dug or at the side of a tank into which a projection can be thrown, a double picotta will be the best form of water-lift, and describes it in detail.

Improved implements to the average ryot are like Krupp cannon to a Chinese army; the ryot must be educated up to them. To do this young, intelligent men, like the young Raja of Parlákimedi, should be induced to visit the shows and make themselves acquainted with the working of improved implements.

M.R.Ry. C. K. Subba Row, Sub-Assistant Director of Agriculture.

(*a*) and (*b*) The heavy draught of the native plough is incommensurate with the quantity of work turned out; besides, the ground is not thoroughly ploughed. One improved plough does the work of two native ploughs.

An improved plough, like the one that won the first prize at Saidápet, in December last, may be made with steel share at about Rs. 4-8-0. Government should appoint a trained smith to teach the smiths in their villages to turn out cheap improved ploughs, and the village smiths should receive pecuniary prizes for passing a practical examination in the manufacture of improved ploughs; these village smiths again should be appointed to teach others, until the manufacture of improved ploughs becomes an easy business; in this way very cheap ploughs can be turned out locally, the only charge being the cost of the materials and the smiths' wages.

The best way to introduce the improved ploughs is to induce a few ryots to use them regularly, under professional supervision, and to take, at the end of the fasli, an account of the comparative work, cost, &c., of the improved and native ploughs.

An improved plough may be turned into a bullock-hoe or a sub-soil plough. Seed-drill, heavy sub-soiler, for special crops, and cheap, efficient water-lift would be highly useful.

Has invented three kinds of water-lifts:—

(1) *The Improved Double Mhote.*—The cost of construction is Rs. 50 against Rs. 150 of the double mhote; easily drawn by cattle; worked very successfully at the Saidápet Farm.

(2) *Water-raising Single Inclined Plane.*—This is the best and the cheapest of all water-lifts worked by bullock-power; it raises *more than double* the quantity of water ordinarily raised per day, but with much less cost and labour; any single mhote may be converted into this at a minimum cost of Rs. 10; it can be made by a village carpenter and smith.

(3) *Water-raising Double Inclined Plane.*—Highly useful under special difficulties, as where the facing of the well where the water-lift is set up may cost much money.

Earnestly requests the Committee to test his invention; would bear the cost of demonstration if it ended in *fiasco*.

M.R.Ry. Nataraja Pillai, South Arcot.

(*a*) It is absolutely necessary to introduce new and improved implements. Specimens of such implements should be kept in the Tahsildars' and Deputy Tahsildars' offices, and their advantages explained to the ryots; they should also be lent to ryots who are willing to test their value by actual use. The demand for such implements cannot now be estimated, because their advantages are, in his opinion, simply incalculable.

(*b*) The implements introduced are novel. Ignorance of their utility alone prevents their introduction. He has seen a wet land which was improved by a *single* ploughing of Massey's plough, while the country plough, worked several times on the same land before, did no good; but the objection was that it *turns over* the soil by which the useless portions are brought to the surface, and valuable manures go down; this is directly opposed to his experience; but the land, after being ploughed, should be exposed to the sun and air for one month for wet lands and for three months for dry lands, otherwise the crops will certainly not grow luxuriantly. The implements should be practically tested and their advantages made known by lectures.

(*c*) Only ploughs and sugar-mills have been introduced; they are very economical and easily worked.

M.R.Ry. N. Vasudeva Row, Ryot of Nellore.

(*a*) and (*b*) There is room for improvement in implements, such as ploughs and water-lifts. Iron ploughs tried in southern districts, but the results inconsiderable. Ploughs should vary with the nature of the soil; but the country plough admirably suited for universal application on wet lands. A cheap, efficient water-lift like the one now exhibited at Saidapet (consisting of two buckets drawn by a single bull) would be a great boon to the ryots; the best way to introduce them is to demonstrate their working at *public fairs* and *festivals*, where large number of ryots assemble The only objections are the prime cost and the difficulty of repair; but these may be got over in time.

Q. III.—Cattle, Sheep and Horses.

(*a*) Defects, with suggestions for improvements in—

(1) Breeding.

(2) Management in health and disease.

(3) Feeding and housing, including the growth of fodder crops and provision of pasturage, private or public.

(4) Means of combating epidemic disease, with the causes of the spread of disease.

(*b*) The advisability and the functions, organization and *personnel* of a department to deal with the breeding, improvement and distribution of improved stock, and the combating with disease.

(*c*) Existence of large stock-breeders, their number, status, operations and results. What inducements exist for private stock-breeding, and what could be added.

Tahsildar of Ráyadrúg.

(*a*) (1) Breeding unknown; sires not selected.

(3) Cattle and sheep in jungles; housing almost *nil*; feeding insufficient; working cattle better treated; fed and housed with the ryot: surroundings unwholesome; fodder crops not grown; working cattle get plenty of straw from the crops.

(4) Preventive measures or precautions against disease *nil*, even when it is in the village; no special care taken of sheep and goats; in scarcity and heavy storms, whole flocks are lost at once.

(c) Cattle-breeding not advisable for want of pasture; hence no stock-breeders; even the grant of stock bulls will be useless.

H. Goodrich, Esq., Collector of Bellary

(a) (3) Cattle unwholesomely housed in unventilated rooms; a tax might be levied on such cattle and none on those kept in cow-sheds.

(4) The Cattle Disease Act should be permanently in force to strengthen the Inspectors' hands.

Rev. E. Lewis, Bellary.

(a) (1) and (2) No attention to breeding or to cattle disease prevention.

(3) No fodder crops are grown. Forest rules preventing jungle grazing are causing distress; as the ryots do not grow fodder.

(b) A department to breed and distribute stock and deal with disease would be very useful.

Tahsildar of Hospet.

(a) (1) No care is taken in cattle-breeding, which is quite promiscuous; stud bulls would be useful; also pony stallions.

(2) Remedies against cattle disease are known, but segregation of diseased cattle is not practised.

(3) Fodder is not specially grown.

(4) Want of salt promotes disease.

(b) Is entirely against a Stock-breeding Department, which would not be useful.

(c) No large breeders.

M.R.Ry. C. Hanumanta Gowd, Hospet.

(a) (3) Pasture scanty; forest laws adverse; cattle are imported.

(c) Cattle-breeding does not exist.

Kurnam of Kanchikera and Reddi of Uchangidrug.

(a) (2) No scientific care taken of cattle and sheep, whether in health or disease.

(3) No proper housing, or pasturage and no fodder crops. Natural pasture only sufficient for six months in years of good rainfall; impossible to avoid insufficiency in the other six months.

(4) Medicine is not believed in as against epidemics.

(b) Talukwar Stock Inspectors necessary; present management not useful; Government may usefully bring in some breeding bulls.

(c) Cattle-breeding not usual; some milk-sellers have good milch buffaloes: only 3 or 4 ryots in the taluk who have 40 or 50 cows each.

Tahsildar of Dharmavaram.

(a) (1) No especial care taken in breeding; custom of swami bulls dying out; some substitute must take their place.

(2) Treatment in disease requires aid.

(3) Forest restrictions are developing the practice of private pasturage. Fodder crops are raised (?).

(b) Approves of the organization of a department for cattle-breeding, &c.

(c) Numerous stock-breeders who supply cattle beyond the taluk; no inducement necessary except prizes.

M.R.Ry. P. T. Rajagopalachariar, Deputy Collector, Gooty.

(a) (1) and (2) Generality of cattle poor owing to bad breeding and bad feeding. Good stud bulls at numerous centres desirable; respectable ryots would feed them without cost; good cattle are well tended. Fodder crops not grown; hence frequent starvation of cattle; pasture lands should be moderately assessed.

M.R.Ry. J. Sreenivasa Row, Landholder and Pleader, Gooty.

(a) (1) Local breeds deteriorated; hence import of Nellore, Mysore, &c., cattle.

(3) Cattle are carefully housed and fed, and fodder crops provided; pasture contracted and ryots aggrieved by unsympathetic Forest Department; poor ryots cannot afford grazing fees.

(4) Epidemic disease has recently developed; probably due to want of earth-salt which is better than sea-salt. Earth-salt should somehow or other be supplied.

(b) Stock Inspectors utterly useless; command no confidence; are considered as troublesome interlopers; if sufficiently supplied with medicine, might be more useful.

Tahsildar of Hindupur.

(*a*) (1) Breeding promiscuous.

(2) Labor excessive; treatment in disease bad.

(3) Feeding careless—over-feeding and starvation alternating. Only draught or milch cattle get food at night. No grass or fodder crops except an occasional catch-crop of cholum or wet land.

(4) Epidemic disease cannot be combated; benefits of segregation must be demonstrated. The ryots will then do the rest with Revenue Department aid.

(*c*) Stock-breeding only in taluk jungles.

M.R.Ry. P. Subba Row, Anantapur.

(*a*) (3) Cereal crops provide fodder. Pasture is provided by fallowing ordinary lands. Such fallows may be exempted from assessment. Forest pasture rules should be slackened.

(4) Present want of earth-salt believed to be the cause of weak and unhealthy cattle. Segregation and the use of usual medicines necessary in epidemics.

(*b*) Stock Inspectors should be increased in number.

(*c*) Private cattle-breeding impossible; Government breeding desirable after the fashion of the Amrat-Mahal. Stud cattle may tour for the benefit of the ryots. Sheep-breeding may be promoted by rewards.

Ryots' Association, Madanapalle.

(*a*) (1) Stud bulls are required.

(3) Pasturage, merely wild grass; fodder crops not grown; cattle not generally housed.

T. Ward, Esq., Madanapalle.

(*a*) (1) Cattle-breeding indiscriminate.

(2) Treatment in sickness bad; segregation unknown.

(3) Pasturage, ordinarily wild grass, with perhaps a little straw for common cattle. Draught cattle better fed and housed. Fodder crops are not grown; might be assisted by remission of assessment.

(4) Want of salt induces epidemic disease. Infected carcases should be destroyed by quicklime.

(*c*) No inducements exist for stock breeding. Great annual fairs supply all wants. Sheep not specially cared for; feed from village to village.

Tahsildar of Wálajápet.

(*a*) (1) and (2) Proper attention not paid to the breeding and management of cattle in health and disease.

(3) Feeding and housing insufficient; farm areas too small for growing fodder crops. Pasture has been reduced by action of Forest Department which causes deterioration of cattle.

(*b*) Local Inspectors per one or two taluks should deal with stock, cattle fairs and exhibitions; prizes should be instituted. The same Inspectors could attend both to agriculture and stock-breeding, both for advice, for inquiry and for positive improvements.

(*c*) Stock-breeding not carried on.

M.R.Ry. C. Ramaswami Reddi, Vakil, Vellore.

M.R.Ry. C. Subbramania Reddi, Vakil, Chittoor.

(3) Pasturage is defective; unoccupied lands are generally bare in the hot weather. Hills and valleys are under the Forest rules, the rigidity of which renders futile any suggestion for cattle improvement.

Rev. J. E. Clough, Nellore.

(*c*) The district cattle shows in Nellore had a good effect. Ceylon burghers have bought up large numbers by which, and by the stopping of the annual show, cattle breeding is sadly on the decline. Recommends re-establishment of the old show.

Tahsildar of Námakal.

(*a*) (1) The ryots are beginning to appreciate the value of good ponies owing to recent breeding operations. Cattle-breeding is more satisfactory.

(2) Treatment in disease defective.

(3) Fodder in the hot weather can hardly be obtained; fodder crops are unknown. Forest rules are too restrictive.

(4) Stock Inspector commands no confidence, not being able to remain in one place above a few days. Veterinary hospitals should also be erected.

(*b*) Cattle-breeding by Government not advisable, since the surrounding circumstances must be considered. Mysore cattle cannot be bred in Tanjore. Government cannot deal with such details, but should deal with disease alone. Necessity for Cattle-breeding Department over-stated and would be a financial failure.

(*c*) Many breeders in Salem, Coimbatore and Mysore pay great attention to it and make large fortunes by it; thousands of good cattle annually sent to the great fairs from the writer's neighbourhood.

W. S. Adams, Esq., V.S., Remount Depôt, Hosúr.

(*a*) (1) and (2) Good ponies can be bred in the district if a good market is assured. Castration of worthless sires, introduction of stallions, and good feeding and treatment are absolutely necessary.

Excellent herds of hardy and strong cattle in the forest near the Cauvery, and could be largely extended. Preservation of this breed required rather than improvement.

Ordinary village cattle suit the ryots' conditions and are not specially bred.

The absence of forage crops an insurmountable difficulty; starved animals cannot develop good breeds; hence the degeneration of the ordinary cattle.

Dr. J. Shortt, Yercaud.

(*a*) (1) and (3) The fodder supply and the provision of pasturage must be developed as a preliminary to good stock. Good stud animals may also be introduced. Sanitation and water-supply good. Fodder, pasture and housing will soon develop good breeds.

(4) Salt is required during epidemics with careful disinfection of the sheds, segregation of the sick, and separate attendants.

Tahsildar of Atúr.

(*a*) (1) Cattle are deteriorating owing to carelessness in breeding. Stud cattle should be introduced.

(3) Housing and fodder require attention.

(*c*) Private stock breeding is induced by the demand; will be encouraged by prizes at breeding centres.

Pattagar of Palayakottai, Erode.

(*a*) (1) Good stud bulls should be used; 4 bulls are enough for 100 cows.

(3) Good feeding and housing will prevent disease: 100 cattle require 200 acres of enclosed pasture lands with a good well for drinking water. The land should be ploughed twice, once in five years and *kolukkatti pul* (கொழுக்கட்டிப்புல் a fodder grass) should be sown. This fodder grass will live for 50 years, if the weeds are kept off the pasture.

Stock-breeding will be developed if pasture lands are moderately assessed.

(4) Contagious diseases are being cured by native medicines.

(*c*) Stock-breeding largely carried on on the mountain slopes; every breeder has 500 to 1,000 cattle; they live by it. Stock-breeding on the plains is restricted to the supply of local needs, as milk, ghee, draught cattle, &c.

M.R.Ry. J. Bhashiakarlu Naidu, Coimbatore.

(*a*) (2) No special management in disease, cattle being left to nature.

(3) Well-to-do owners feed cattle well with gram and cotton seed. Fodder crops are not raised; half a ryot's land is sometimes under natural pasture, the other half under crop.

(4) Epidemics not specially dealt with and cattle generally succumb.

(*b*) A special breeding department unnecessary. The Local Stock Inspector, not of much use.

(*c*) Stock-breeding, as a business, not practised except in forests; sheep not specially bred.

Secretary, Planters' Association, Nilgiris.

(*a*) (1) Breeding promiscuous.

(2) and (3) Good feeding, housing, clean water, and proper sanitation are required. Silos will be useful.

(4) Segregation, necessary in cases of epidemics.

(*b*) There are large stock-breeders in Salem and Coimbatore districts, who highly value their pedigree bulls.

J. Stevenson, Esq., Madras.

(*a*) (1) Experience has shown that when good bulls are available, the ryots took little trouble to secure their services. Improved sires are earnestly desired, but there are difficulties

in eliminating useless, mal-formed, undersized and ill-bred animals. Stud cattle would be used only if stationed in the villages; and all services should be *gratis* to induce the people and to prevent extortion by subordinates.

Dewan Bahadur R. Ragunatha Row, Madras.

(*a*) (1) and (3) Stock greatly requires improvement, but nothing will succeed while Forest and Revenue Settlement rules deprive people of their pasture.

(4) Education and veterinary hospitals are necessary.

(*b*) No separate department needed; all that is wanted is to remove obstacles, viz., want of pasturage and income-tax on stock-breeders.

M.R.Ry. P. Thegaraya Chettiar, Madras.

(*a*) (1) and (3) Cattle and sheep are deteriorating; goats "completely dying out," owing to the action of the forest laws, before which there was good grazing and stock was properly kept up. Another reason is the carelessness in breeding at least in Southern districts. Grazing facilities must be given by relaxing the forest laws and foreign bulls should be introduced.

(4) Cattle disease should be dealt with by prevention. Salt is a necessary and Government should find a means to admit of its use.

Hon'ble S. Subramania Iyer, Madras.

(*a*) (1) The numerous temple bulls of former times are now rare; no attention is paid to breeding. Small cattle, such as Aden or Punganúr breeds, may be introduced in the South.

(3) Cattle-breeding has been affected by the abolition of holdings upon grass-tax and of remission on waste land. Forest operations will not improve matters. Recommends the re-introduction of the *pillu-vari* system; chola nâthu growth should be encouraged by reduction of assessment.

M.R.Ry. P. Rangiah Naidu, Zemindar, Chingleput.

(*a*) (1) and (3) Want of fodder and salt are causing disease and degeneration. Stud bulls placed with village heads are also necessary.

(*b*) Professionals for curing disease are useless and would waste money; disease should be prevented.

J. Lee-Warner, Esq., Collector of Chingleput.

(*a*) Considers the difficulties of cattle problem insuperable under the present conditions and habits of the ryots. Improvement must arise from a prosperous people. Good cattle will be produced under good conditions, *e.g.*, on the cotton soils, good cattle are necessary and are therefore bred and carefully tended.

(*b*) Stock Inspectors, almost useless; medicines, frequently thrown away; they themselves become disheartened; hence an increase to the department would be a waste of funds.

M.R.Ry. V. Parthasaradhy Iyengar, Deputy Collector, Chingleput.

(*a*) Want of pasture due to the vast increase of population, chief obstacle to good cattle. Moreover, the land is exhausted, the ryot insufficiently fed, and therefore the cattle are uncared for. Pasture land should be set apart in each village at $\frac{1}{4}$ to $\frac{1}{5}$ the assessment. The growth of fodder crops, the better treatment of animals in health and disease depend upon the example of wealthy ryots whose co-operation should therefore be sought.

M.R.Ry. Narainswami Nainar, Gingee.

(*a*) (1) Castration should be earlier than at present.

(2) Diseased animals should be segregated.

(3) Cattle chiefly feed on coarse natural grass; there are no proper pastures.

(*c*) Private stock-breeding should be encouraged by Government aid.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

(*a*) (1) and (3) Cattle very defective, chiefly due to want of proper pasturage. Forest pastures, though available, are not utilized, not being within easy reach. The spread of cultivation has reduced village commons and pastures. The distance of forest reserves causes great loss of cattle. Large local pasture grounds should therefore be allotted on small grazing fees to groups of villages.

(2) and (4) Cattle are neglected by ignorance, not by indifference. The causes of diseases are not understood. Segregation is understood and practised, but the carcase is carelessly disposed of; hence the spread of contagion. The treatment in disease is merely empirical.

(*b*) There should be experts at least in every Revenue Inspector's division.

(*c*) For professional breeders, separate tracts and higher fees. Stud bulls should be placed at various centres and should suit the existing breeds and the requirements of the people. Fodder crops are hindered by heavy assessment which should be reduced in such crops.

H. Sewell, Esq., Collector of South Arcot.

(4) Ryots are apathetic in cattle disease, and village customs spread it.

(*b*) Stock Inspectors must be much more numerous, at least talukwar.

(*c*) No large stock-breeders.

M.R.Ry. K. Veeriah Vandiar, Pundi, Tanjore.

(*a*) (1) Breeding of cattle and sheep are not altogether satisfactory.

(2) Ryot's management generally fairly satisfactory, but capable of improvement.

(3) Poverty and want of pasture are causes of deterioration. The old system of allotting 25 per cent. for grazing in each village is absolutely necessary.

(*b*) Departmental operations, not necessary; Revenue Department experiments in stock-breeding hitherto, a failure.

(*c*) No large stock-breeders.

M.R.Ry. A. P. Thandavaraya Pillai, Ayampolliem, Trichinopoly.

(*a*) (2) Treatment in disease is empirical; Government must give greater aid.

(3) Chief cause of deterioration in cattle is want of pasture and fodder crops. Forest reservation of poramboke is another cause. Fodder crops are a necessity if good cattle are to be bred.

(*b*) Would be good, but a special establishment would be very expensive.

G. W. Fawcett, Esq., Collector of Trichinopoly.

(*a*) (3) Has only seen fodder crops (pacha jonna) in the Kistna district.

(*c*) Trichinopoly, unsuited for cattle-breeding.

M.R.Ry. T. Ranga Row, Deputy Collector, Madura.

(*a*) (1) Recommends a systematic development of the ancient custom of dedicating bulls to temples; the introduction of good rams requisite; also that of buffaloes from Central India and Guzerat for milking purposes.

(3) Feeding and housing of cattle fairly well understood. Fodder crops are not generally grown, because they would not pay; in favorable places and seasons they are occasionally grown; valuable lands suitable for such growth should be set apart by the Revenue Department on low assessment. Pasturage should be similarly dealt with, lands under patta being, if necessary, taken up. Government should also put down its waste lands in good grass, repeating the process every five years. Calls attention to a fine fodder grass regularly grown in Berar.

(*b*) No separate department is required to deal with cattle-disease, the present regular medical officers being sufficient; recommends that the present Local Fund medical officers should also be veterinary practitioners. Considers that Stock Inspectors should be allowed private practice, just as in the case of medical officers. Would employ a regular department for stock-breeding, the officers of which should itinerate with their stud cattle. Believes that good stud cattle will be much in demand.

(*c*) Cattle-breeding is a great indigenous industry, and the ryots are very proud of their good cattle.

J. Thompson, Esq., Collector of Tinnevelly.

(*a*) (1) Stock-breeding is not systematic.

(2) Management indifferent.

(3) Cholum is grown as a fodder crop, but pasturage generally is wanting; there should be large reserves for grazing.

M.R.Ry. D. Subramania Pillai, Mittadar, Ilangi, Tenkasi.

(*b*) Government might undertake stock-breeding.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector, Madura.

(*a*) (1) Many years ago every big land-holder kept many cattle, but no special care was taken in breeding; this is now less customary. Many villages own sacred bulls—a practice to be recommended. Sheep breeding is very primitive.

(2) Cattle indifferently managed. Healthy and diseased cattle are kept together.

(3) Fed when there is fodder and starved when there is none. Pasture is only sufficient near hills and forests; fodder crops are elsewhere necessary; cholum is so cultivated in many dry villages, but cattle are worst off in the wet villages where fodder cannot be profitably grown on the high assessed lands. Believes that education is the chief remedy in this and other matters.

(*b*) Cattle-disease may be combated to some extent by a larger staff, but education is the only effective method. Recommends a stock-breeding department if only to draw public attention to the cattle question. Information should be collected regarding diseases and native method

of treatment and proper instructions issued. Persons passing in these instructions should get certificates as cattle-disease practitioners. Expensive and elaborate arrangements are unsuccessful and undesirable. The method should be that of education from native practices and specifics, and not by totally ignoring them in favor of novel and expensive machinery and medicines.

M.R.Ry. M. R. Ramakrishna Ayar, Tinnevelly.

(*a*) (1) Foreign breeds unnecessary, there being good indigenous breeds. Stud bulls should be provided for groups of villages, and put in charge of some respectable land-holders.

(2) Considers that cattle are well treated. Objects altogether to the box system. In disease the management is defective owing to ignorance. A Tamil reprint of a small work on cattle-disease should be issued gratis or at a nominal price.

(3) Cholum fodder is grown. Pasturage is wanted. The Forest Department should strictly reserve, say, one-third of present reservations, and throw open the remainder for a short time in the dry season ; present restrictions are too severe.

(*b*) A cattle-breeding and disease department should be a branch of a separate agricultural department. Many more Stock Inspectors are required ; more medicines should be issued and the hospital pound system extended.

(*c*) No present inducements to private stock breeding ; these should be afforded.

M.R.Ry. K. Annaswami Iyer and A. Somasundaram Pillai, Tinnevelly.

(*a*) (1) and (3) Cattle-breeding is hindered by want of tax-free pasturage owing to late settlement operations. Those left for pasture are generally miserably unfit ; at least 15 per cent. of every village should be set apart for tax-free pasturage.

(*b*) There should be an Agricultural Inspector, with knowledge of cattle diseases in each taluk. Medicines and instructions should be kept with each monegar.

M.R.Ry. R. M. Ambalavana Pillai, Tahsildar, Sátúr.

(*a*) (1) Cattle-breeding, not studied.

(3) Feeding, defective; private pasturage, not available except in zemindari and inam villages where grazing fees are charged. Forest Department is reserving porambokes and hill-forests ; free grazing should be allowed in all such places ; in other villages 10 per cent. of the area of inferior lands should be allowed.

(*b*) Stock Inspectors should be at least 1 per taluk. Vernacular pamphlets should be supplied *gratis*.

M.R.Ry. R. Anantarama Iyer, Deputy Collector, Tinnevelly.

(*a*) (1) No systematic cattle-breeding in his division ; the best breeding is near the hills, where there is sufficient pasture ; in other places, very indifferent.

(2) Animals, sickly and crowded with vermin. The sheds where they are kept for security at night are often sickeningly filthy ; the feeding troughs, never cleaned except by the filthy water from the roof in rainy weather. Management during sickness is correspondingly bad ; an animal is not considered ill till serious symptoms appear. Medical treatment is almost unknown ; cattle sometimes recover in spite of the treatment.

(3) Pasture has been restricted by the spread of cultivation, and fodder crops are insufficiently grown ; for several months in the year, the ground is hard and grassless ; the straw of cereal crops is the chief fodder, and is often lost by fires ; ordinary cattle have to pick up what they can get on the waste lands, and get nothing at night unless in hard work or milk. The principal remedy is regular communal pasture.

(4) Believes that cattle-diseases are preventible if each man will do his own part. Classes might be opened for teaching rural cow-doctors.

(6) A single Stock Inspector for a district is useless ; one per taluk would have ample work in giving instructions and advice. Local agricultural societies when formed will effect much in this matter. Breeding by private enterprise should be encouraged rather than Government operations.

H. M. Winterbotham, Esq., Collector, Malabar.

(*a*) (3) Pasturage, always very scanty (Malabar) in dry season, and paddy straw, almost the only fodder, is scarce and dear. Good breed of cattle could not flourish for want of food.

M.R.Ry. K. Raman Unni Nayar, Malabar.

(*a*) (2) Diseases are rife, but cause and cure unknown.

(3) Cattle, gradually deteriorating from the growing scarcity of pasture and fodder.

(*b*) Publication of free information in vernacular tracts, and the supply of medicines through numerous officers will effect a great deal.

M.R.Ry. V. Chappu Menon, Deputy Collector, Calicut.

(*a*) (1) Cattle-breeding is entirely neglected; ryots do not consider it within their duty; young and old, healthy and sickly, all herd together; hence deterioration.

(2) Segregation in case of disease is not practised; hence whole herds are swept away. All diseases alike are treated by a few simple remedies.

(3) Cattle-feeding is miserable, though paddy straw is plentiful and green grass available for more than six months. Human effort is weak, because nature has been bountiful. The only public pastures are the forest reserves.

(4) Cattle-disease spreads by contact in markets and failure to segregate. Revenue Inspectors might be supplied with a few improved medicines; simple printed instructions for treatment should be issued to all officers and Revenue Inspectors.

(*b*) Disapproves of a special department for breeding and keeping stock. The department should deal with all classes of agricultural improvements. There should be a Taluk Inspector to deal with all agricultural matters under the supervision of committees hereafter described.

(*c*) No large stock-breeders exist.

M.R.Ry. P. Karunakara Menon, Deputy Collector, Malabar.

(*a*) (1) No attention is paid to breeding.

(3) Pasturage scanty; fodder crops unknown; reserves should be provided with grazing fees.

(4) Disease is probably caused by poor, bad food and water; it is spread by neglect.

(*b*) Would not increase the present efforts.

Wynaad Planters' Association, Malabar.

(*a*) (1) Improvement in cattle, impossible until fodder is provided.

(2) Cattle are so worthless and professional advice so hard to get that it is often best to leave sick cattle alone, merely segregating.

(3) Land reserved by Forest Department might be made to grow the better grasses for silage.

M.R.Ry. J. Sriranga Rajah, Tinnevelly.

(*a*) (1) There is no system of breeding, which is promiscuous.

(*a*) Cows and bulls should not be allowed to go together. Wishes legislation for the purpose.

(*b*) All bull-calves except those reserved for breeding should be castrated.

(*c*) The ryots should be taught the first principles of breeding.

(*d*) Government must establish stud-bulls in convenient centres and all service in the beginning should be gratis.

(2) Treatment is ignorant and empirical, and cures are the result of nature.

(3) Causes of disease are bad food and water, bad housing, bad management during epidemics, overwork. Pasture lands have been broken up for cultivation; stall-feeding is coming in; straw is stored and fodder crops occasionally grown. This provision is often insufficient and starving animals are then driven away in hopes of finding other pastures. Waste lands are now generally too limited to be reserved as Government pastures. Government should now reserve large blocks of waste land wherever available. Fodder crops are, however, chief remedy; *e.g.*, as a stolen crop on single crop wet land; this is occasionally done even on second crop lands, so also on the dry black lands; this system must be extended, though the country is a temperate zone. The alternations of hot sun and rain cause much mortality from want of housing.

(4) Contagious diseases are spread by the habits of common grazing or from infected centres on trade routes; even when sick, it is not separated and treatment is deferred till too late.

(*b*) Recommends an efficient staff of Stock Inspectors; one to a district is almost useless; the mere giving advice is of no avail and is sometimes mischievous because misunderstood or badly carried out. Similarly, medicines must be given under direct supervision. Hence Stock Inspectors must be more numerous, and hospital stations established. The Stock Inspectors may take charge of cattle-breeding operations.

(*c*) All the best cattle are imported and not bred in the district. The annual cattle-fairs are the places of purchase.

M.R.Ry. N. Ganapathi Pillai, Manager, Etaiyápuram Estate.

(*a*) (1) The ryots are perfectly indifferent as to cattle-breeding; hence deterioration. Good stud-cattle are necessary; rich landlords may be induced to keep them.

(2) Treatment in health and disease, especially the latter, is unsatisfactory.

(3) North-east Tinnevelly is wholly cultivated, so that there is no pasture; hence cholum fodder crops are extensively raised. Housing is generally indifferent.

(4) No method is known of dealing with epidemics.

(*b*) A separate department is inadvisable, as it would be costly and badly supervised. Government efforts should be confined to aiding and stimulating big landholders.

M.R.Ry. D. Ananthaiyar, Deputy Collector, South Canara.

III.—Canara is unsuitable to stock-breeding.

M.R.Ry. S. Sesha Aiyangar, Nagarcoil.

(*a*) The cattle of Southern districts are miserable; sheep are small and weak.

(1) The ryots are indifferent about cattle-breeding, though immense facilities exist; none to stimulate them nor Government aid. In each district, sufficient grazing lands should be set apart and a (stock) farm established. The Nellore, Mysore and Aden bulls should be introduced to improve the cattle.

(2) Proper feeding, housing and moderate work are necessary to prevent disease.

(3) The cattle are now miserably fed. Pasture lands should be given in each village and the ryots made to cultivate fodder crops. Fodder grasses should be developed on the mountain slopes and on the waste lands near them for pasturage and ensilage. The stalls should be well-ventilated and cattle well-fed and kept.

(4) The healthy cattle and the sick graze and herd together; and the disease spreads by contagion. Segregation is the first remedy, and then medicines should be given.

(*b*) A (stock) farm should be established in each district. Milch breeds should be improved by the introduction of good bulls. Bulls for breeding should be selected and carefully brought up; the rest must be castrated; when in good condition and in sufficient numbers, the bulls may be distributed. The disease must be combated by persons of veterinary training, who are not available now. A single Stock Inspector for a district is not enough. A department for each district is necessary and its officers should itinerate throughout the district, making inquiries and giving advice. There should be a Veterinary Surgeon and a dresser in every district hospital, who must conduct the department.

(*c*) There is no large stock-breeding at present. A Government stock farm in each district will encourage private stock-breeding; big landholders may be induced to start such farms. The Government must only introduce superior breeds.

M.R.Ry. Perumal Mudaliar, Alwarkurichi, Ambásamudram.

(*a*) (1) The cattle of the district are very miserable.

(2) Tamil books containing instructions for management in health of disease should be published.

(3) Waste lands in each village should be set apart for pasturage. Cattle in the villages adjoining the forests should be allowed free grazing in them. Lands devoted to the growth of fodder crops should be exempted from assessment.

(4) Ryots are perfectly indifferent in cases of epidemics, and ignorant in the methods of curing. The healthy and the diseased are grazed together and stalled together. Every village should have a hospital pound which should be under the supervision of the village headman, who should be instructed in cattle diseases.

(*b*) A department is necessary to improve the cattle, which, he believes, would be profitable to Government. A single Stock Inspector in a district is quite insufficient. The Stock Inspectors should have also charge of the breeding operation in the district. They should instruct the ryots in cattle diseases and should be aided in their work by Revenue officers. Cattle Disease Act should be extended to this district.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

(*a*) District farm should breed—

(1) Stock and distribute to rich and intelligent ryots.

(2) A Tamil pamphlet on the management of cattle in health and disease should be published and distributed to rich and intelligent ryots. The district farm should have a scientific stock-breeder and veterinarian.

(3) Jungles should be reserved, if possible, in each village, or in a group of villages, for pasturage on payment of a very light rent, and should supply free wood for implements and fuel. The growth of fodder crops should be encouraged by imposing only a quarter of the assessment.

(4) Epidemics, chiefly attributed to want of proper feeding and housing, and also over-working. The district farm should have a veterinarian.

M.R.Ry. P. N. Subbramania Ayar, Dindigul.

(*a*) (1) There is no system of breeding at present.

(2) The ryots are ignorant of the proper management in health and disease, and the cattle are generally left to themselves.

(3) Fodder crops are not generally raised, and natural pasture restricted by forest rules. Speaks with favor of the old system of allotting pasture lands in each village known as "Samuthayam."

(4) The Cattle Disease Department has done very little till now in this direction.

(*b*) The present Cattle Disease staff is very insufficient and inefficient. The functions of the department should be chiefly—

(1) To conduct experiments on the nature and prevention of diseases.

(2) To keep sick stalls.

(3) To castrate useless stock.

(4) To suggest means of securing better pasture and inducements for fodder cultivation.

(5) To collect and report on statistics of live-stock and the available food for cattle.

(6) To point out the defects of the Revenue administration so far as it affects agriculture.

The number and quality of the inspecting staff should be improved. Pay and promotion should be made more attractive. Subordinate service (clerks, lascars, &c.,) should be largely increased to enable Stock Inspectors to thoroughly discharge their duties.

(*c*) There is no large stock-breeding owing to—

(1) Insufficient pasture and (2) ignorance in cattle-breeding.

M.R.Ry. Basavanna Goud, Patel of Amidali Village.

(*a*) (1) The country cattle only suited to the red soil; unsuited to the clay soil; hence the Mysore and Nellore breeds should be introduced. If Government should provide stud bulls (two or three) for each taluk, just as in Mysore, the breed will, no doubt, be improved.

(2) Management in health and disease is the same.

(3) Feeding and housing generally attended to; fodder crops are not raised; cattle graze in Government waste lands.

(4) The present arrangements for combating diseases imperfect; Government medicines effective to some extent. A solitary Inspector for a whole district is of no use.

(*b*) Recommends a special department for stock-breeding and cattle-disease prevention.

(*c*) No large stock-breeders; sheep bred in large numbers.

M.R.Ry. Venkata Reddi, Narnur, Rámallakót.

(*a*) (2) Occasional use of earth-salt keeps the cattle healthy.

(*b*) There should be a separate staff of Inspectors for cattle-disease prevention; they should teach the village headmen, who are men of experience, how to treat sick cattle.

M.R.Ry. C. K. Subba Row, Sub-Assistant Director of Agriculture.

(*a*) (1) Bad feeding puts off maturity, and promiscuous breeding tends to degeneracy. All worthless bulls should be castrated when a year old. Government should give pecuniary prizes for the best breeding and pedigree bulls in each village or group of villages.

(2) All cattle are kept together and disease rapidly spreads. The ryots should be taught the importance of inspecting the cattle every morning and evening at their stalls and segregating the sick, if any, from the healthy.

(3) Early harvesting would secure more nutritious fodder than when the crops are cut dead ripe. A trained agriculturist should be deputed to cause the harvesting of grain-crops to be done at the proper time in a number of villages and to submit a full report on the subject. Common salt is very essential for cattle. Cattle, as a rule, are very badly housed; and loose-box system should be introduced. *Fodder* crops *can* be raised without interfering with the cropping routine; if the cold weather crops are sown as early as possible, they may be harvested early in the dewy season; if the land be ploughed immediately and sown with horse-gram, a crop of fodder may be obtained in about two and half months. It is easier still to raise a fodder crop on wet land after the harvest of paddy; but Government must notify that no second-crop

assessment will be charged in such cases. Besides, the waste lands not taken up for cultivation may be laid down to grass, but the assessment should be remitted. When water-supply is insufficient, fodder crops may be grown, but should not be charged. A trained agriculturist should set an example in this direction. Fodder crops may be encouraged by grants of money proportionate to the quantity of fodder raised. The ryots cannot provide sufficient pasture for their cattle; it behoves local boards and municipalities to provide pasturage; public pastures should be free until the ryots appreciate their value; they should be well laid down to grass and kept clean; the ryot is now obliged to send his cattle long distances for poor pasture.

(4) The ryot has a vague idea of contagious diseases; he is often willing to segregate if there be good accommodation. Each village should possess a hospital pound for keeping the sick cattle in charge of the village officers.

M.R.Ry. Nataraja Pillai, South Arcot.

(2) Cattle should be worked in health and left alone in disease, kept clean and well housed. Sick cattle should be segregated, their dung and urine carefully removed from the floor and fresh earth thrown on the spot, and all impurities should be washed.

(3) Ryots should be encouraged to devote a portion of the patta land to pasturage by remission of assessment, and waste lands should be given at low assessment.

M.R.Ry. N. Vasudeva Row, Ryot of Nellore.

(*a*) (1) The system of breeding draught cattle seems perfect; but the crossings of the Mysores with the Nellores may be tried.

(3) Improvement in cattle impossible unless Government afford facilities to the ryots to adopt a system of *fallowing*.

(4) The chief causes of diseases are (1) under-feeding from insufficient pasture, (2) and absence of salt in cattle-food. Sufficient pasture and cheap salt are essential remedies.

(*b*) Stock Inspectors have not done much good. The present staff insufficient. The local veterinarians should be encouraged by money prizes for successful treatment. The ryots should be persuaded to avoid the barbarous system of branding and cutting the cattle.

Q. IV.—Methods of Cultivation.

The principal needs for and possibilities of improvement in methods, especially in-

(*a*) Fallowing, bare or green.
(*b*) Manures and manuring.
(*c*) Rotation and growth of mixed crops.
(*d*) Irrigation and the economical use of water.
(*e*) After-cultivation.
(*f*) Harvesting operations including preparation for market.
(*g*) Special crops, such as cotton, indigo, sugar, &c.

Tahsildar, Dáyadrúg.

Improvements, not necessary.

(*b*) Manure, insufficient; leaf manure, now too costly owing to unduly high seigniorage which should be struck off and free licenses issued for all except Tungabhadra ryots who are well-to-do and without fear of losing their valuable cane crops, while other ryots have to work very hard under very precarious irrigation to get even paddy crops.

Rev. E. Lewis, Bellary.

Poverty causes bad practice.

(*b*) The value of manure is known, but manure is scarce.

(*c*) Rotation would be practised, but that food-grain is an absolute necessity.

Tahsildar of Hospet.

(*b*) The storage and use of manure are capable of improvement; much of its value is lost by exposure.

M.R.Ry. C. Hanumanta Goud, Hospet.

(*b*) Forest rules cause difficulty in getting leaf manure.

Karnam of Kanchikera and Reddi of Uchangidrug.

(*a*) Dry lands are not fallowed (?).

(*b*) Sometimes a sort of gingelly or sunn-hemp is grown and ploughed in when green: sometimes the fibre is first taken, and then the leaves, &c., used as manure. Manure generally is

not protected from the weather : exposed both in the pits and in heap on the field for a long while : much is used as fuel. Bones, &c., are not used.

(*c*) Rotations and mixed crops are known, but not strictly carried out.

Tahsildar of Dharmavaram.

(*b*) Manurial knowledge, imperfect.
(*c*) Rotations, practised.
(*f*) Preparation for market, crude.
(*g*) Special crops should be more cultivated.

M.R.Ry. J. Sreenivasa Row, Pleader, Gooty.

Can suggest no improvement in existing cultivation which appears quite suitable.

Tahsildar of Hindupur.

Does not think improvement called for. The ryot considers season all powerful, human effort (?) comparatively useless.

(*d*) Considers the irrigation works might be improved by utilizing communal labour encouraged by temporary remission : water is considered to compensate for insufficient manure ; hence much waste.

M.R.Ry. P. Subba Row, Anantapur.

Present methods of cultivation, good enough.

(*b*) Cattle-dung, ashes and leaf manure, generally in use : the latter only on wet lands.

(*c*) Rotations are practised, *e.g.*, on red soil—cholum and pulse, 1st year ; only castor, 2nd year ; waste or samai crop in the 3rd year.

(*f*) Improvements in preparation for market, if demonstrated, would be adopted, such as paddy husking, winnowing, &c.

T. Ward, Esq., Madanapalle.

(*b*) Storage of manure should be improved.
(*c*) Rotation not, practised.
(*d*) Tank water is wasted.
(*f*) Preparation for market, imperfect.

Tahsildar of Walajah.

(*a*) Fallows at present not adopted ; should be encourged by remission of assessment.

(*b*) Manures not properly preserved, not sufficient ; only some lands are manured ; cattle-dung hardly used as manure, chiefly for fuel. Leaf manure should be given free of charge.

(*c*) Rotation is known and practised.

(*f*) Harvesting and market preparations defective.

Tahsildar of Atúr.

(*b*) Leaf manure is in great demand. Forest rules and greedy Forest subordinates oppress the ryots and restrict cultivation.

Pattagar of Palayakotai.

Deep ploughing is necessary.

(*b*) The droppings of cattle and sheep should be placed in a pit, mixed with some water, and removed once in six months and applied to the soil. Leaf manure is also used.

(*d*) Well irrigation, precarious, river irrigation is the best.

(*f*) Some crops should be reaped close to the ground and some above.

(*g*) The larger production of special crops is necessary.

M.R.Ry. J. Bhashiakarlu Naidu, Coimbatore.

(*d*) Water-distribution arrangements are still imperfect ; poor ryots are unable to satisfy the demands of the lower subordinates.

Secretary, Planters' Association, Nilgiris.

(*b*) & (*d*) Refers to his (General Morgan's) essays on coffee soils and on the utilization of irrigation water, 1883.

J. Steavenson, Esq., Madras.

(*b*) Green manuring is well understood.
(*c*) Rotations, practised though the principle is probably not understood.
(*d*) The proper use of water is not understood.
(*f*) Preparation for the market is dirty and defective.

Dewan Bahadur R. Ragoonatha Row.

(*a*) Fallows being charged for are therefore objected to.

(*b*) Manure will be secured by the removal of the hindrances (such as want of pasturage).

(*c*) Rotations are known; the only improvement necessary is by lectures and tracts written colloquially by landlords and not by modern educated people.

(*d*) Due attention should be paid to sluices and the utilization of surplus.

Honorable S. Subaramaniya Iyer, Madras.

(*a*) Fallows should be encouraged by easier assessment.

M.R.Ry. P. Rangiah Naidu, Zemindar, Chingleput.

(*d*) Water-rate and dry assessment should be reduced. No water-rate to be charged for water taken from rivers, &c., at the ryot's cost.

J. Lee-Warner, Esq., Collector of Chingleput.

We have little to teach the ryot in theory.

(*d*) When water is used uneconomically, the ryot is not to blame, but the sluices or agents of distribution. Considers that irrigation is the first, markets, roads, &c. the second essential in improvement; the other developements will follow ensuing prosperity.

M.R.Ry. V. Parthasaraay Iyengar, Deputy Collector, Chingleput.

The ryot is well acquainted with good theory and practice.

(*c*) He knows the exhausting effect of various crops grown without rotation, that the changes of crops are beneficial, &c.; this knowledge is dying out, and the ryot, from various causes, such as poverty, does not practise what he knows. His theoretical knowledge should now be collected and embodied in text-books for schools.

M.R.Ry. Narayanaswami Nainar, Ginges.

IV. Methods are defective, and fallowing, manuring, irrigation, weeding, storage of produce and market preparation.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

(*a*) Fallows are practised, but the principle is not understood.

(*b*) The proper storage of manure and the principle of manuring are not understood. Leaf manure is now costly.

(*d*) The economical use of water is now understood, though not necessarily practised. Moreover the surface drainage causes loss of manure.

(*f*) Dead-ripe harvesting certainly causes loss in grain.

M.R.Ry. K. Veeriah Vandiar, Pindi, Tanjore.

Existing methods are the best.

(*b*) Present manures sufficient; other manures costly and unremunerative; would store manure on the fields long before the time of cultivation but for fear of theft by neighbours.

(*c*) Rotation of two and three years known and practised.

(*d*) Irrigation is very insufficient in spite of all economy.

M.R.Ry. A. P. Thandavaraya Pillai, Ayampolliem, Trichinopoly.

IV. Methods are defective and hampered by custom and ignorance.

(*d*) Work by Public Works Department much neglected and even hindered. Hence irrigation should be under an Agricultural Department working through a local committee.

G. W. Fawcett, Esq., Collector of Trichinopoly.

(*b*) Manurial practice is well understood: what is wanted is capital to spend upon it.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector, Madura.

(*a*) Considers that fallowing has decreased since Government have charged full assessment on fallow lands; want of fallowing has decreased the produce.

(*b*) Ryots should be encouraged to grow trees to provide leaf manure; such improvements would cost nothing, and materially improve the country. Existing manures are insufficient in quantity. Industrious ryots use all sorts of manure except bones, lime, artificial manures and poudrette.

(*d*) Public Works Department channels should be repaired by the end of April so that the ryot may have his lands ploughed before the south-west monsoon.

M.R.Ry. M. R. Ramakrishna Iyer, Tinnevelly.

(*a*) Poor lands are generally bare; fallowed to avoid the expense of manuring; green fallowing is not adopted.

(*b*) Suggests a scientific study for manurial purposes including analysis of crops, manures and soils.

(*c*) Rotations are known and practised.

(*d*) Water is not used in excess.

M.R.Ry. V. Chappu Menon, Deputy Collector, Calicut.

(*b*) Manuring is defective in practice from ignorance of principle.

(*d*) Irrigation is not ordinarily required in some places. It is considered as a sin of ingratitude to God who sends abundant rain from heaven.

M.R.Ry. J. Sriranga Rajah, Tinnevelly.

(*a*) Bare fallowing is a necessary practice owing to the methods of cultivation. Green fallowing is unknown. Catch-crops of pulse are grown between rice crops, but not for the purposes of green manuring.

(*b*) Rotations are known and observed, but are not based on a knowledge of principle.

(*c*) Better manuring desirable.

(*e*) After-cultivation is defective in dry lands, probably because the crops are not sown in lines; hence the necessity of seed-drills. Demonstration would be easy.

(*f*) Thinks there is little room for improvement in harvesting operations; the crops might be gathered earlier.

(*g*) Suggests the introduction of superior varieties of cotton and sowing in rows.

M.R.Ry. N. Ganapathi Pillai, Manager, Etaiyápuram Estate.

(*a*) Fallowing is practised in spite of the demand for assessment since soils are poor.

(*b*) Manuring is defective for want of means and ignorance. In this matter the knowledge of principles is absolutely necessary to improve practice; valuable and accessible manures are not used. Strongly advocates the use of night-soil, the introduction of which he has himself proved to be feasible; complains of the export of bones.

(*c*) Rotation is known and practised, though the principle is not understood.

(*d*) Irrigation water is used abundantly to keep down weeds; less water and more weeding would increase the crop as under wells.

M.R.Ry. S. Sesha Aiyangar, Nagercoil.

IV. Improvements are necessary and feasible. Waste lands should be given free of assessment for eight or ten years. Lectures and district farms are essential to improvement.

(*a*) Ploughing is very defective; improved implements are necessary.

(*b*) Urine, sand, lime, bone, salt, ashes, dung, litter, straws, leaves, &c., are valuable manures, but are wasted by ignorant ryots; they should be kept in a dung pit and carefully covered, and spread on the fields when sufficiently decomposed.

(*c*) Rotation would be beneficial, but must vary according to soil and climate; suggests a rotation of four years' course—first year cholum and cotton, second year indigo, third cholum and pulse, fourth guinea grass.

(*d*) A good irrigation pump would be very economical for the ryots. Proper use of water is necessary and its neglect is causing much expense and loss.

(*e*) Crops are weeded and manured.

(*f*) Harvesting operations are expensive and inconvenient, and require improvement; improved implements are necessary. An intimate knowledge of trade demands would lead to a better preparation of grains, &c., for the market. Hence commercial education necessary.

(*g*) The indigenous cotton gives a poor yield; has successfully experimented on New Orleans cotton and recommends its introduction. The introduction of improved sugarcane mills should be encouraged.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

The existing methods are well-adapted to the country and do not require any great improvement; good cattle, good implements, good means of irrigation and some capital are required to carry them out to perfection.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

The hard and fast rules of revenue demand and collection preclude all possibility of improvement.

(*a*) *and* (*b*) Lands lying fallow or laid to grass should get partial or total remission. The durkhast rules should be relaxed to revive the old "Samuthayam" system.

(*c*) Rotation and mixed crops not unknown; practised wherever possible.

(*d*) The ryot errs least in the matter of irrigation.
(*f*) Harvesting of *special crops* needs great improvement.
(*g*) Capital and knowledge are pre-requisites to the extension of special crops.

M.R.Ry. Basavanna Goud, Patel, Amidali Village.

(*a*) The red soil is left fallow for two years, once in every five years; clay soil is never fallowed.
(*b*) Cattle and sheep dung are manured.
(*c*) Rotation is practised.
(*g*) Indigo and sugar-cane not grown here.

M.R.Ry. Venkatt Reddi, Narnur, Rámallakót.

(*a*) The land should be ploughed soon after harvest, as the ground is then soft and the weeds are easily removed.
(*b*) Manure-pits should be dug in the compound or in front of the houses; the refuse of the cattle food, and of the bazaar and the houses should be collected and stored in them, and the drainage of the houses and the bazaar should be allowed to flow into the pits, so as to putrify the whole mass; in this way much manure can be saved. Green leaves are not used as manure in these parts.
(*c*) Rotation is practised in wet lands.
(*d*) If there are more nirganties (water-distributers), there will be less wastage of water.

M. R. Weld, Esq., District Judge, Ganjam.

(*b*) Cattle are turned on the fields and they manure them; but their droppings are picked up for fuel and little even of the ashes goes back to the land, for those who take the cow-dung, &c., are not the cultivators. Cheap wood fuel would, to some extent, stop this, and this might be supplied if village plantations could be grown. The planting of the entire sea-coast with casuarinas would be a great step in this direction; private persons take up these plantations about Madras and in most places where the Forest Department have shown the way. This is so along the Bápatla coast in Kistna and the practice is spreading into Répalle.

M.R.Ry. C. K. Subba Row, Sub-Assistant Director of Agriculture.

(*a*) The land should be thoroughly ploughed after harvest and exposed to the air; better still to grow horse-gram or mochakottai (மொச்சைக்கொட்டை) and plough it into the soil. A qualified agriculturist should carry out bare or green fallowing without prejudice to the ryot's cropping programme.
(*b*) Cattle urine not conserved; cattle-dung generally burnt as fuel and the little that is kept for manure is carelessly exposed to sun and rain. The loose-box system would save much valuable manure, and was a perfect success at Saidápet; or the cattle-dung and all the vegetable refuse should be stored in a manure-pit and the urine drained into it; the ryot may collect leaves and grass in the slack season and put them into the manure-pit. A live fence of corkapully will supply ample fuel. A trained agriculturist should demonstrate practically the advantages of the loose-box system. Pecuniary prizes may be offered for good manure. Night-soil now wasted. Temporary scavengers for collecting night-soil should be employed under a trained agriculturist, who should demonstrate the advantages of the night-soil as manure. Bones, blood and tannery refuse, &c., now wasted. Government should collect them and prepare manures, distribute them gratis to ryots, for a year or two.
(*c*) There is no regular system of rotation. Mixed cropping prevails; will be advantageous to grow such tall-growing crops as cholum in alternate lines with cotton.
(*d*) The practice of puddling involves a serious wastage of water; but if wet land be deeply and thoroughly tilled with aid of the moisture supplied by rain and cultivated with varieties of paddy accustomed to dry tillage, a very large saving may be effected in irrigation water. If Carolina or Madagascar paddy be generally introduced, a still further saving will be effected.
(*e*) The ryot does sometimes practice after-cultivation, though the crops may not be sown in lines; but it will be more satisfactory if the seeds are drilled in lines.
(*f*) The crops should be harvested earlier than when dead-ripe; otherwise good deal of first-class seeds shed on the ground and are wasted, and the straw becomes less nourishing.
(*g*) The advantages of sub-soiling and interculture in the case of special crops should be practically demonstrated. Sowing in lines facilitates the gathering of cotton. The seed for indigo should be obtained from the first cutting instead from the second, as is now generally done.

M.R.Ry. Nataraja Pillai, South Arcot.

(*a*) Fallow lands should be *ploughed*.
(*b*) Dung, ashes and other refuse should be collected and stored, and stirred up at least once in six months.
(*d*) The irrigation canals should be kept in proper order and the field banks strengthened.
(*f*) The harvested grains should not be kept in damp and unventilated places.
(*g*) For special crops, the land should be ploughed deeper (three-fourths of a foot deep), in which case finer crops may be obtained.

M.R.Ry. N. Vasudeva Row, a Ryot of Nellore.

There is room for improvement in the methods of cultivation.

(*a*) Fallowing should be encouraged by remission of assessment.

(*b*) Much ignorance prevails about manures; they should not be exposed as now done. Manure-pits might be dug at fairs and festivals, to illustrate a proper system of conserving manures.

(*d*) Economical irrigation is carried to a great extent. Objections, in some quarters, to the system of water distribution being in the hands of Public Works Department while the revenue collection is in the Revenue Department; but so long as the ryot is supplied with a sufficient quantity of water at *the proper season* he will not complain.

Q. V.—Inducements to Improvements.

The best methods and classes of inducement to improvements, *e.g.*—

(*a*) By exhibitions.

(*b*) By pecuniary prizes—

(1) At exhibitions.

(2) At fairs and festivals.

(3) On the field or farm.

(*c*) By honorary rewards and titles.

(*d*) By commercial developments, such as markets, roads, &c.

Q. VI.—Exhibitions.

Suggestions for improvement and development in popularity and effect, as, for example, by printed pamphlets and the appointment of guides for the oral description of exhibits and the encouragement of discussion.

Tahsildar of Ráyadrúg.

V. (*a*) and (*c*) Even exhibitions are useless and not understood, as also honorary rewards.

(*b*) Money rewards will be effective.

(*d*) Weekly markets and good roads to them will induce care in production, as good profit can be then secured.

H. Goodrich, Esq., Collector of Bellary.

The cost of experiments must be borne by the wealtheir classes.

Rev. E. Lewis, Bellary.

V. (*a*) Exhibitions are educational stimulants.

(*b*) Prizes at them should be combined with field or farm prizes.

VI. Printed leaflets before and at the exhibitions would do good.

Tahsildar of Hospet.

V. (*a*) Exhibitions give no real inducement to improvement; prizes are won by purchasing in the bazaar and sifting the grain purchased.

(*d*) Good markets are of much value.

VI. Only *bonâ fide* growers should be allowed to show their produce; explanation and discussion should be promoted; facilities offered to exhibitors; hard and fast rules modified; free transit to and fro granted; delay at railways done away with; judges should be really qualified.

M.R.Ry., C. Hanumanta Goud, Hospet.

V. (*a*) Has seen three exhibitions and taken part in managing two; exhibitions have not fulfilled their purpose; are visited only as a *show*. *Implements* are not properly tested or seen in operation by the ryots. Is aware of inferior mechanics getting the prizes against better ones; is competent to speak, being a large prize-winner; *cattle* prizes were gained by buyers not by breeders; a prize of Rs. 75 was gained for a bull bought for Rs. 100

(*b*) Prizes may be well awarded at fairs and festivals.

VI. What is wanted is not half-an-hour's work, but regular competition at the places of produce, continuing over a long period. *Produce* must be grown and not bought at shops, and must be samples of stock and not small specimens specially prepared, as in jaggery; *manufacturers* should be granted prizes at places of production and to artisans, not to officials, &c., for their old clothes or other articles.

Karnam of Kanchikera and Reddi of Uchangidrug.

V. and VI. Exhibitions in every district annually would be useful, preceded by lectures in markets and villages. Prizes should be given to ryots and artisans at fairs and festivals; also for produce and cattle in the villages themselves. Money prizes suit poor people; honorary titles are for the richer.

Tahsildar of Dharmavaram.

V. (*a*) Exhibition not attractive, being distant and very temporary, and the competitive idea undeveloped.

(*b*) Prizes at cattle fairs useful.
(*c*) Honorary rewards not cared for by the ryots.
(*d*) The communicating railways will provide markets for the produce.

M.R.Ry. P. T. Rajagopalachariar, Deputy Collector, Gooty.

(*a*) Has personal experience of last three exhibitions; such shows will fail of their object; non-producers simply buy products and exhibit. Nellore cattle dealers, who are no breeders, are the chief exhibitors of cattle and prize-takers. Though some ryots exhibit, it was often by the inducement of the authorities. Exhibitions premature.

M.R.Ry. J. Sreenivasa Row, Pleader, Gooty.

V. (*a*) Present exhibitions useless; only officials and purchasers get benefit.
(*b*) Highly approves of field and farm prizes, also at fairs and festivals to actual producers.
(*c*) Honorary rewards useless.
(*d*) Public markets would much develope trade.

Tahsildar of Hindupur.

V. Demonstration is the method needed by the ryot generally.

(*a*) Exhibitions not beneficial to the ryot who requires field demonstrations in actual practice.

(*b*) and (*c*) To superior ryots, honorary rewards and prizes at fairs, festivals and exhibitions are useful. To ordinary ryots farm prizes only are suitable, as also for the superior ryots.

M.R.Ry. P. Subba Rob, Anantapur.

V. (*a*) Has experience of Bellary and Gooty exhibitions. They are a total failure; offer no inducements to producers, prizes being obtained by mere purchasers at bazaars and even in distant districts; not even known to the ryots who would not take the trouble to come if they know.

(*b*) Would confine money prizes to exhibitions.
(*c*) Rewards and titles may be given to successful promoters of the exhibition of produce by ryots.
(*d*) Roads and markets sufficient in the district.

VI. Taluk exhibitions for producers only might be useful. Expensive pandals and establishments not required; any open place sufficient; each class to sit in groups; judges to inspect, decide and pay the rewards on the spot and in public; rewards may be restricted to the more important items.

Ryots' Association, Madanapalle.

V. (*a*) By taluk exhibitions.
(*b*) With pecuniary prizes.
(*c*) By honorary rewards and titles.

T. Ward, Esq., Madanapalle.

V. (*b*) Prizes might be given at big cattle fairs, *e.g.*, Punganur.

Rev. J. E. Clough, Nellore.

VI. Agricultural exhibitions useful in awakening interest.

Tahsildar of Wálajápet.

V. (*a*) and (*c*) Exhibitions, to be periodical and in all important places, with plenty of prizes, special rewards, honorary or otherwise, to those who promote improvements.

Dr. Bradshaw, Inspector of Schools, Central Circle.

VI. Small talukwar exhibitions would be more useful than the present; local exhibitions at large cattle fairs.

Tahsildar of Námakál.

V. (*a*) and (*b*) (1) Prizes at fairs and festivals would benefit producers indirectly, middle men directly; (3) does not approve of field or farm prizes except for special products. Prefers exhibitions and demonstration farms with the distribution of printed advice.

(*c*) Rich men will appreciate honorary rewards.

(*d*) Communications and markets have developed cultivation in extent, but not in intensity; the quality of produce is unimproved or even deteriorated.

VI. Would increase the number and duration of exhibitions.

Dr. J. Shortt, Yercaud.

V. (*a*) Approves of frequent exhibitions.

(*b*) and (*c*) Pecuniary and honorary rewards may be tried.

VI. Exhibitions far too few and not understood; should be annual in every district with minor ones monthly or weekl in chief places with intelligent persons to explain and to encourage discussion.

Tahsildar of Atúr.

V. (*b*) and (*d*) Approves of prizes at fairs, festivals, and farms and the opening of markets.

VI. Exhibitions may be improved by issuing printed leaflets and promoting discussion.

M.R.Ry. I. Bhashikarlu Naidu, Coimbatore.

V. (*a*) and (*b*) Approves of exhibitions and the grant of pecuniary prizes.

(*c*) Honorary titles, if clearly granted for good work and not by favor or chance, may occasionally be useful.

(*d*) Village roads should be improved. Markets should spontaneously multiply. Dissemination in print of information about large yields and the methods of getting them would be useful.

Secretary, Planters' Association, Nilgiris.

V (*a*) Exhibitions are useful, but judges should be practical.

(*b*) Prizes should be fewer and higher in value; smaller prizes at fairs or festivals, and on the field or farm.

(*c*) Honorary rewards acceptable to the wealthy.

Messrs. Oakes and Co., Madras.

V. (*a*) and (*b*) Approve of exhibitions; money prizes, sufficiently numerous, would stimulate native competition. The exhibit should be the result of the prize winner's labor. Do not believe in honorary rewards.

VI. The chief improvement desirable in exhibitions is in the judging; the judges are often not well chosen and in a hurry; hence discouragement to exhibitors who have spent time and money. Exhibitors should be present during the judging, and their explanations should be noted by a special reporter for use when deciding and for entry in an official catalogue.

J. Steavenson, Esq., Madras.

V. Example is the most efficacious teacher, the native being highly imitative as shown in the practice and details of casuarina plantations. The example of forest reservation will probably confer untold benefits on the ryots who will have to imitate. Imitation should be strongly encouraged; is aware of the appreciation of the ryots of the effect of the writer's plantations on the bare, blowing sands.

(*d*) Would improve village communications by leaving the ordinary field tracts unploughed.

Dewan Bahadur R. Raghunatha Row, Madras.

V. No inducement worth the name can be offered till security of tenure is vouchsafed to the land-owners.

(*a*) Exhibitions not successful.

(*d*) Markets and roads could induce such improvement as is possible under the revenue system.

M.R.Ry. P. Theagaraya Chettiar, Madras.

V. (*a*) Exhibitions are useless; very few ryots go, and, when there, simply stare and go away.

(*b*) Special medals may be given to the best producers.

Hon'ble S. Subbramania Iyer, Madras.

V. (*a*) and (*b*) Purely agricultural exhibitions at well-known festivals with pecuniary rewards are likely to be effective.

(*c*) Honorary rewards and titles will be useful; is aware of anxiety for such titles; efforts would be made by big land-holders towards improvements if such rewards would follow.

M.R.Ry. P. Rangiah Naidu, Zemindar, Chingleput.

V. (*a*) Exhibitions very useless; many exhibitors were mere purchasers from bazaars, who sifted out the best produce as samples. Ryots close to the show simply went to see the *tamasha*, not to gain knowledge.

(*b*) (3) Special prizes should be given for field improvements and superior crop cutting.

J. Lee-Warner, Esq., Collector of Chingleput.

V. (*a*) Disbelieves entirely in exhibitions as a method of education.

(*c*) Honorary rewards might stimulate big land-holders.

(*d*) Believes most in markets at all chief places with local superintendence and aid.

M.R.Ry. V. Parthasaradhi Iyengar, Deputy Collector, Chingleput.

V. (*a*) Doubts the success of exhibitions in teaching the ordinary ryot; they are too few and too brief in duration. Poor ryots should be encouraged to visit them and obtain explanations.

(*b*) (3) Field and farm prizes desirable.

(*c*) Also honorary rewards for meritorious exertion.

(*d*) Markets are rapidly springing up and need no encouragement.

M.R.Ry. Narainaswami Nainar, Gingee.

V. (*a*) Exhibitions may prove incentives to improvement.

(*c*) Honorary titles will affect some people at least.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

V. (*a*) If exhibitions are to be useful, their objects must be explained. Ryots often believe they are feelers preliminary to taxation.

(*b*) (1) Prizes can only be useful given at exhibitions.

(*c*) Is doubtful of honorary rewards for ryots.

(*d*) Government interference in commercial development is unnecessary; ryots will find out the best markets. Communications, however, should be carefully attended to.

H. Sewell, Esq., Collector of South Arcot.

V. (*a*) Is not yet prepared to pronounce as to the value of exhibitions, but is not sanguine.

(*b*) and (*c*) Prefers pecuniary to honorary rewards.

(*d*) Roads are more than sufficient. Markets might be improved.

M.R.Ry. K. Veeriah Vandiar, Pundi, Tanjore.

V. Government experiments are necessary.

(*a*) Exhibitions are unnecessary.

(*b*) and (*c*) Improvers should be rewarded with titles or money according to status.

M.R.Ry. A. P. Thandavaraya Pillai, Ayampolliem, Trichinopoly.

V. (*a*), (*b*), (*c*) Exhibitions, prizes, and honorary rewards are not valued.

What is wanted is the example of big men. If mirassidars can acquire honors and distinctions by agricultural improvements, they will turn their attention to it.

G. W. Fawcett, Esq., Collector of Trichinopoly.

V. (*a*) Disbelieves in ordinary exhibitions as incentives to improvement; a *large* exhibition may, however, benefit the district where it is held.

(*c*) Considers that honorary titles would be the strongest stimulus to land-holders who have not the English incentive of competition.

M.R.Ry. T. Ranga Row, Deputy Collector, Madura.

V. Approves of all the suggestions in the question.

VI. Approves of all the suggestions in the question.

J. Thompson, Esq., Collector, Tinnevelly.

V. (*c*) Honorary titles would induce improvement.

BENGAL SECRETARIAT LIBRARY

M.R.Ry. D. Subbramania Pillai, Ilanji, Tenkasi.

V. There are no inducements at present for improvement. Good agriculture should be encouraged by itinerating teachers.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector, Madura.

V. (*a*) and (*b*) Doubts the value of exhibitions and pecuniary prizes hitherto; exhibitions are waste of money and even oppressive to ryots who are compelled to exhibit.

(*c*) Honorary rewards may be granted to rich ryots who pioneer progress.

M.R.Ry. M. R. Ramakrishna Ayar, Tinnevelly.

V. Approves of the suggestions in the interrogatory.

VI. Approves of the suggestions in the interrogatory.

M.R.Ry. R. M. Ambalavana Pillai, Tahsildar of Sátúr.

V. (*b*) (3) Farm and field prizes are very preferable to those given at exhibitions.

(*c*) Honorary rewards useless for ryots.

(*d*) Roads between markets and railways should be opened for which Local funds are insufficient.

M.R.Ry. R. Anantarama Iyer, Deputy Collector, Tinnevelly.

V. (*a*) Exhibitions, as lately held, of little use; they produce no effect on the people generally. If held, they should be restricted to the encouragement of novelties.

(*b*) (2) Has similar objections to prizes at fairs and festivals.

(3) Rewards granted in villages would have a really beneficial effect; makes suggestions for such a system as regards judging, rewards, objects of rewards. Local societies will aid in this matter, Government giving grants-in-aid; in fact local land-holder should be stimulated to do what the Government is now expected to do.

(*c*) Honorary titles should be granted to those who improve their estates and the condition of their tenants.

M.R.Ry. K. Raman Unni Nayar.

V. The ryot is willing to adopt improvements if proved such to his satisfaction and within his reach.

M.R.Ry. V. Chappu Menon, Deputy Collector, Calicut.

V. (*a*) and (*b*) Approves of exhibitions and prizes, but not in the absence of local committees.

VI. Approves of circulation of leaflets and of discussion.

M.R.Ry. P. Karunakara Menon, Deputy Collector, Malabar.

V. Considers the best incentive to be the example of Europeans who would settle down in district and cultivate for profit with new implements, methods, &c.

(*a*) and (*b*) Exhibitions and pecuniary prizes at fairs are probably useful.

(*c*) Honorary rewards probably useless.

(*d*) Numerous markets exist, and roads are fairly sufficient.

Mir Shujaat Ali Khan, Esq., Head Assistant Collector, South Canara.

V. The ryot can only be influenced to adopt innovations by ocular demonstration of their profitableness. Advice is useless. Example on successful farms is essential to adaptation.

(*a*) Does not believe in exhibitions and Government experiments.

(*b*) (2) and (3) Prizes at fairs and on the field and farm would be very beneficial.

(*c*) Prefers the plan of inducing *substantial* farmers by the grant of honorary rewards and titles to give their sons a practical education. All honors and rewards should be given on due system; favor and chance must be eliminated, so that ryots may confidently count on a reward for genuine effort.

(*d*) A trade demand will also successfully induce the cultivation of new produce.

M.R.Ry. J. Sriranga Rajah, Tinnevelly.

V. (*a*) Exhibitions do not reach the ryots generally and do not act as incentives to growing better crops. Moreover, the prizes are really taken not by producers, but by purchasers of samples. Doubts even if cattle-breeders are stimulated by prizes. Shows of advanced implements and machinery are useless in the present state of agriculture and objections to innovation; prizes should be limited to implements slightly developed from native patterns. The chief value is in the social meeting of ryots and the ploughing competitions.

(*b*) (1) and (2) Prizes at exhibitions, fairs and festivals are therefore not of much value.

(3) Prizes for fields and farms will prove strong inducement to improvement, and the successful farms will be excellent examples.

Temporary reduction of assessment may be given to those who will experiment with improved ploughs, seed drills, diversified cropping, &c.

(c) Honorary titles will prove inducement to agricultural improvement and may be given to those who use *bonâ fide* effort.

Vernacular lectures and pamphlets will aid progress. Agricultural journals, which are now being started, should be aided by Government.

VI. Prizes at exhibitions should be for simple implements, and especially to smiths who exhibit their own manufactures. The judging must be improved. Favoritism and jobbery should be excluded. Lectures and the stimulation of discussion at the exhibition are very desirable.

M.R.Ry. S. Sesha Aiyangar, Nagercoil.

V. Strongly approves of all the suggestions in the interrogatory.

VI. Strongly approves of all the suggestions in the interrogatory.

M.R.Ry. Perumal Mudaliar, Alwarkurichi, Ambâsamudram.

V. (a) Exhibitions should be held in each district during fairs and festivals.

M.R.Ry. D. Ananthaiyar, Deputy Collector, South Canara.

V. (a) Took part in the Gooty and Bellary exhibitions, 1887 and 1888. Does not believe that they induce improvements. As the settlement was going on in those districts, ryots believed that the object of the exhibitions was to gauge the yield of the land for assessment purposes; hence great aversion to exhibit. Exhibits are the result of official energy.

(b) (3) Prizes, such as implements with inscriptions and certificates given for the field or farm would be much more appreciated than prizes at exhibitions or fairs. Distribution of prizes with compliments in a ryot's own village before his friends would be a high encouragement.

(c) Disbelieves in honorary rewards to ordinary ryots.

(d) Roads and markets will extend cultivation, but not improve it.

VI. Exhibitions will improve in popularity only as education improves. Much may be done by publishing printed leaflets and distributing, not through officials, but through rural schoolmasters and direct to all respectable ryots.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

V. (a), (b) Annual exhibitions should be held in the district farm during an important festival, and pecuniary prizes given to the best exhibits.

(c) Honorary titles may be given to zemindars, poligars, and wealthiest landlords and others who take a remarkable interest in agriculture.

(d) Roads and markets should be developed for encouraging the traffic of agricultural produce.

VI. The people should be guided by some one appointed for the purpose and the exhibits described.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

The present Land Revenue system is the *real* obstacle to improvement and should be rectified first.

(a) Exhibitions will be useful as introducing best samples to the notice of the people, but will be useless where means are wanting to utilize the knowledge.

(c) Honorary rewards and titles, useless and premature.

M.R.Ry. P. Basavanna Goud, Patel of Amidali.

V. (b) (3) The system of field or farm prizes is the best inducement.

M.R.Ry. Venkata Reddi, Narnur, Rámallakót.

V. (a) All people cannot attend exhibitions, owing to difficulty of communication.

(b) Prizes at fairs and festivals will prove a great inducement.

(c) Certificates of merit will no doubt encourage the rich, but will have little effect on the middle and lower classes of people.

M.R.Ry. C. K. Subba Row, Sub-Assistant Director of Agriculture.

(b) Pecuniary prizes on the field or farm will certainly stimulate the ryots in the neighbourhood.

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M.R.Ry. Venkata Reddi, Narnur, Rámallakót.

V. (a) All people cannot attend exhibitions, owing to difficulty of communication.

(b) Prizes at fairs and festivals will prove a great inducement.

(c) Certificates of merit will no doubt encourge the rich, but will have little effect on the middle and lower classes of people.

M.R.Ry. O. K. Subba Row, Sub-Assistant Director of Agriculture.

(b) Pecuniary prizes on the field or farm will certainly stimulate the ryots in the neighbourhood.

It will be well to offer prizes for (1) the successful growth of valuable exotic crops, (2) for the growth of fodder crops, (3) for the production of the best seeds of ordinary staples, (4) for the best live-stock of different kinds and classes, (5) for the largest outturn of the best quality of manure from a given number of cattle, &c.

M.R.Ry. N. Vasudeva Row, Ryot of Nellore.

V. and VI. Strongly recommends all the inducements suggested in the interrogatories.

(*e*) Elementary education of a practical character must be introduced as early as possible into primary, middle and normal schools, and children of agriculturists should be taught the modern improved methods in every department.

Q. VII.—Agricultural Education.

(*a*) The class of men sent to Saidápet College.
(*b*) The method of their selection.
(*c*) The objects of their being sent or of their application to be sent.
(*d*) The results of their education—
  (1) upon themselves as agriculturists or public servants,
  (2) upon the progress of agriculture.
(*e*) Elementary education in agriculture, theoretical and practical—
  (1) in High and Middle schools,
  (2) in Primary schools,
  (3) in District Normal schools.
(*f*) Experimental farms and stations; their desirability, objects and usefulness.
(*g*) Educational farms or gardens attached to schools, farm schools and school farms.
(*h*) Suggestions for making all classes of agricultural education—
  (1) popular,
  (2) really practical.
(*i*) Text-books.

Tahsildar of Ráyadrúg.

(*a*) Chiefly Brahmans.
(*b*) Landholders' sons would be selected, but are not available.
(*c*) The candidate's object is to get Government posts.
(*d*) The graduates give advice to people.
(*e*) Elementary agricultural education is most desirable.
(*f*) Experimental farms and stations not necessary.
(*g*) But school farms and gardens are desirable.

H. Goodrich, Esq., Collector of Bellary.

VII. Training at Cirencester is good in its way, but for India the training should be in typical regions.

Tahsildar of Hospet.

(*a*) and (*c*) Men intending to take to agriculture do not go to Saidápet; they are men who want Government service and who have hitherto failed in education or otherwise. They are unpractical and apt to be conceited.

(*h*) It is practice that is wanted, not theory; only big landlords' sons who will take to agriculture should be admitted; Government appointments in other departments should *not* be given. Facilities might be allowed them in getting land.

M.R.Ry. C. Hanumantha Goud, Hospet.

(*c*) Men go to Saidápet to gain appointments, not to practise agriculture, which does not pay students.

(*d*) Most men go to some other branch of Government service and are thus useless as specialists.

(*e*) Elementary agricultural education with farm or garden added would be very valuable.

(*h*) Local lectures if given by a *practical* man would be very useful.

(*i*) So also vernacular text-books on special subjects, such as cotton, indigo, sugar, tobacco, &c.

Karnam of Kanchikara and Reddi of Uchangidrug.

(*a*) and (*c*) Men without landed property go to Saidápet for Government employment.

(*d*) If trained and not employed agriculturally, they will be useless.

(*e*) Agricultural teaching in secondary schools would be useful.

(*h*) Stock Inspectors might give agricultural instruction, but are too few and are always travelling; at least one for two or three taluks is necessary.

(*i*) Good text-books should be published on the chief matters.

Tahsildar of Dharmavaram.

(*e*) Agricultural education in schools desirable.

(*h*) Saidápet graduates should be made to practise agriculture; otherwise their special knowledge will be wasted.

M.R Ry. J. Sreenivasa Row, Pleader, Gooty.

(*c*) and (*d*) With few exceptions, Saidápet students enter in order to get Government posts; are therefore neither influential with ryots nor zealous in agriculture.

(*e*) Elementary instruction in agriculture desirable.

(*f*) Much approves of experimental farms and stations for demonstration and suggestion.

(*g*) School farms and gardens necessary.

(*h*) Landholders should be encouraged to study.

(*i*) Easy books on agriculture for school and general purposes desirable.

M.R.Ry. P. Subba Row, Anantapur.

(*a*) and (*b*) Candidates for Saidápet may be selected from Middle School examinees, their status as landholders and consequent probability of their subsequent usefulness being considered.

(*e*) Elementary education in all schools desirable.

(*f*) Experimental stations desirable at head-quarters.

(*g*) School gardens open to the public desirable.

M.R.Ry. C. Ramasami Reddi, Vakil, Vellore.
M.R.Ry. C. Subramania Reddi, Vakil, Chittoor.

(*e*) Rather than have a Central College at Saidápet, would give agricultural education in Middle and High schools, with reduction of school-fees for the children of ryots.

(*f*) Efficiency would be promoted by talukwar experimental farms; these will be frequented by ryots attending the cutcherry.

Dr. J. Bradshaw, Inspector of Schools, Central Circle.

(*b*) Free scholars should be nominated by zemindars under a pecuniary guarantee of subsequent employment; half the scholarships should be reserved for non-English-speaking candidates to prevent their seeking Government posts.

(*c*) Government service is the chief aim. Restriction should be put on the grant of non-agricultural posts to Saidápet graduates.

(*d*) Saidápet graduates chiefly enter Government service as Revenue Inspectors. Their agricultural knowledge is useless, for they do not communicate their special knowledge to the ryots.

(*e*) Agriculture is seldom taught in schools. The subject is optional, and the Tamil text-book (Translation of Robertson's Class-book) bad and unintelligible; should be compulsory in all Normal schools and for all teachers.

(*f*) Experimental farms desirable.

(*g*) School gardens should be attached to Normal school, for giving practical instruction, for the benefits of the exercise, to accustom the students to manual labor, and to foster the introduction of rural school gardens.

(*h*) The University might introduce an Honor's course with examination and prizes for Agriculture; professors might give a course of lecture in up-country towns on agricultural science. People's park, with garden, gymnasium, museum, &c., should be provided in all towns.

Tahsildar of Námakal.

(*f*) Example farms yielding profits and demonstrating improvements are the great panacea.

G. McWatters, Esq., Collector of Salem.

(*c*) To obtain Government employ.

(*d*) Has ten Saidápet graduates in employ as follows:—

Revenue Inspectors	5
Clerks	3
Estate managers (Court of Wards)	2

(1) Their moderate agricultural book knowledge does not even make them good Revenue Inspectors.

(2) All are absolutely devoid of influence towards improving agriculture.

Dr. J. Shortt, Yercaud.

(*b*) The officers selecting students have scarcely any choice.
(*c*) The great majority only desire Government appointments.
(*d*) Saidápet education good, but not sufficiently practical.

Pattagur of Palayakottai, Erode.

(*e*) Agricultural education should be given to all people. Agricultural profession is more honorable than Government service.

Secretary, Planters' Association, Nilgiris.

(*a*) Saidápet candidates should belong to the agricultural classes, of strong physique and should be expressly warned not to expect Government employment. Practical men must be employed in practical work. College syllabus good. College should not be under the Director of Public Instruction.
(*e*) Agriculture should be taught in all schools.
(*f*) Experimental farms in each district and of varied sorts are essential to the success of an agricultural department in benefiting the ryots.
(*g*) Strongly supports the idea of school farms or gardens.
(*i*) Professor Johnston's text-books and an agricultural gazette in the vernacular would be useful.

Dewan Bahadur R. Ragunatha Row.

(*d*) Believes that Saidápet education has benefited its graduates, but not agriculture.
(*e*) and (*g*) General education should include elementary agriculture. Theory should be taught in class and explained at the nearest field.
(*f*) Disapproves of experimental farms and stations.
(*i*) Simple text-books colloquially written and teaching fundamental principles are necessary.

M.R.Ry. P. Theagaraya Chettiar, Madras.

(*a*) Saidápet students are not of the ryot classes.
(*b*) Revenue officials should induce rich ryots to send their sons, who should then demonstrate their knowledge on their own lands.
(*c*) Almost all enter to get posts.
(*d*) The college education should be suited to present agriculture.
(*f*) Experimental farms may be usefully introduced in taluks near the cutcherries.
(*e*) and (*i*) Easy text-books should be introduced in all schools, and especially village schools.

Honorable S. Subbramania Iyer, Madras.

(*d*) Saidápet graduates have not been sufficiently encouraged by assured employment which should now be guaranteed.
(*e*) and (*g*) Elementary education highly desirable in all schools, especially District Normal and Middle, with a farm or garden at some schools. Would attach farms and gardens to jails where agricultural facilities exist.

M.R.Ry. P. Rangiah Naidu, Zemindar, Chingleput.

(*a*) All Uncovenanted Civil Service officers should study at Saidápet College.
(*f*) Experimental farms near taluk cutcherries are desirable.
(*h*) The college to be affiliated to the University which should grant degrees and certificates.
(*e*) and (*i*) Easy agricultural text-books should be supplied to all village schools and agricultural leaflets to all ryots.

J. Lee-Warner, Esq., Collector of Chingleput.

(*e*) and (*i*) Strongly believes in the diffusion of easy agricultural text-books and in teaching agriculture in all primary schools.
(*h*) Revenue candidates should be required to have some practical knowledge. The Agricultural College should be confined to turning out agricultural teachers.

M.R.Ry. V. Parthasaradhi Iyengar, Deputy Collector, Chingleput.

(*c*) They care only to obtain any decent public employment.
(*d*) Saidápet graduates are ignorant of their own agriculture without experience; they become prejudiced against and decry native agriculture; their attainments are superficial and they are merely men of theory.
(*i*) Would frame easy text-books for schools based on existing native practices.

M.R.Ry. Narainasami Nainar, Gingee.

(*a*) Some rich landholders have gone to Saidápet, but generally they are middle-class men.

(*b*) Those should be selected who are landholders and who undertake to put their knowledge into practice.

(*d*) The education will certainly improve practice and the value of public servants.

(*e*) Would extend agricultural elementary education to all schools.

(*f*) There should be two or three experimental farms in each district.

(*h*) College graduates should be employed to lecture in the villages.

(*i*) Easy text-books should be circulated.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

(*b*) Sons of landholders should be selected as students. Agricultural societies should aid in their selection.

(*c*) Saidápet candidates chiefly look to Government service.

(*d*) Zemindars have employed Saidápet graduates, but ryots in general have not benefited as the men themselves are merely paid agents and not landholders.

(*e*) Government service is supposed to be the object of school education; hence ryots object to send their children to such schools.

(*f*) Considers experimental farms useless since they do not show profit.

(*g*) Educational farms at elementary schools would be more useful.

(*i*) Information in the vernacular should be disseminated amongst the ryots.

H. Sewell, Esq., Collector of South Arcot.

(*a*) District students at Saidápet are landholders or their relatives.

(*d*) Five graduates (Saidápet) are employed as Revenue Inspectors and taluk gumastas; too soon as yet to pronounce an opinion as to their special value.

M.R.Ry. K. Veeriah Vandiar Pundi, Tanjore.

(*a*) Saidápet candidates in general are *nominal* landholders.

(*b*) Selection according to apparent respectability.

(*c*) Government service is the candidate's object, not agricultural development.

(*d*) No progress, because the graduates are not landholding agriculturists.

(*e*) Simple practical education in primary schools, theoretical and practical in High, Middle and District Normal schools, very necessary. Trained normal teachers will diffuse their knowledge.

(*g*) A large educational farm at the District Normal school, small ones at Middle and High schools are desirable, also at important villages. An agricultural farm school may be established in every district.

(*h*) Agricultural education must be simple, cheap and encouraged by grants.

(*i*) Agricultural tracts should be widely distributed; text-books should be suited to each district.

M.R.Ry. A. P. Thandavaraya Pillai, Ayampalliem, Trichinopoly.

(*a*) Men of higher classes are not required for training at Saidápet.

(*b*) Selection should not be made by the Collectors, who simply approve the Sheristadar's nomination. Big landholders should send intelligent lads who will be employed under them.

(*d*) Saidápet graduates as Revenue Inspectors, &c., of little special use. They must be trained for service under landholders.

(*e*) Agricultural education in schools should be general and practical; lads thus trained will be useful to serve under landholders.

(*f*) One experimental farm must be started in each district, supervised by a committee of Collectors and good landholders, the cost being borne by the committee.

(*g*) School farms unnecessary; boys should work on the committee's farm side by side with the ryots.

(*h*) Education is absolutely necessary to stimulate thought, intelligence and a perception of change in changing conditions.

(*i*) Text-books from primers onwards should be carefully drawn up.

G. W. Fawcett, Esq., Collector of Trichinopoly.

(*a*) Saidápet graduates are landless boys.

(*c*) Aiming at Government service.

(*d*) Therefore useless towards spreading agricultural knowledge. The book knowledge gained is forgotten as easily as acquired; hence the result to themselves and agriculture is *nil*. Has considerable experience as he was Collector of Chingleput.

(*e*) Disapproves of elementary education in high, middle and district normal schools, because they are merely avenues to Government service. In primary schools such instruction would be useful, if good; but is doubtful whether it would be good.

(*f*) Would have an experimental farm in each district provided—

(1) that it had good land,

(2) that it was managed by a practical European expert with local knowledge,

(3) that it should be easily accessible to ryots; failure, however, would be a serious blow to progress. Saidápet failed as it did not satisfy the above conditions; so also the North Arcot Society in 1884.

(*g*) Considers that school farms or gardens would at present only do harm, but might follow experimental farms, if successful.

M.R.Ry. T. Ranga Row, Deputy Collector of Madura.

(*d*) Instances the uselessness of Saidápet graduates who are Revenue Inspectors.

(*e*) Is inclined to doubt the advantage of agricultural education in schools in the present state of agriculture.

(*f*) Strongly approves of district, experimental and example farms. Theory without practical demonstration is useless.

(*g*) If agriculture is taught in schools, there should necessarily be school gardens or farms.

J. Thomson, Esq., Collector of Tinnevelly.

(*e*) Agricultural subjects should be compulsory in High and Middle schools.

(*h*) Revenue Inspectors should be entirely drawn from Saidápet graduates.

M.R.Ry. D. Subbramania Pillai, Ilanji, Tenkási.

(*a*) Saidápet students should only be sons of landholders who do not intend to enter Government service, but will devote themselves solely to agriculture and agricultural education.

(*e*) Agricultural schools should be established in every district. The system of education should be wholly connected with agriculture.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector of Madura.

(*a*) Only intending agriculturists should be sent to college.

(*c*) Men go to Saidápet as being a sure and easy door to service in the Revenue Department.

(*d*) Graduates have not followed agriculture as a business; hence their action on agriculture is *nil*; their special education is no qualification for public service.

(*e*) Strongly recommends elementary agricultural education in all schools and compulsory up to Matriculation; this would give ease in following out the business and revive the honorable opinion anciently entertained of agriculture.

(*g*) School farms are necessary for practical training.

(*h*) Education should be gradually introduced and must be practical; should be based on existing methods which should be carefully examined and taught with suggestions for improvement. All attempts should be simple and cheap.

(*i*) No existing text-book is suitable; should be prepared after careful study of each district.

M.R.Ry. M. R. Ramakrishna Iyer, Tinnevelly.

(*e*) Elementary agricultural education should be given in all schools including the district normal schools.

(*f*) District experimental farms should be established at head-quarters, if possible attached to the normal school; only by example can ryots be educated to accept innovations.

(*h*) Agricultural education is a legitimate charge on Local Funds.

(*i*) Text-books are necessary, but can only be compiled by men who combine science and complete local knowledge, both practices and their reasons. A committee might compile such text-books.

M.R.Ry. K. Annaswami Iyer.

M.R.Ry. A. Somasundaram Pillai, Tinnevelly.

(*e*) Elementary agricultural education should be given up to Matriculation and made compulsory for examinations.

(*f*) Experimental farms at each district head-quarters with annual exhibitions are necessary, since the ryots can only be affected by visible demonstration, and it is not possible to induce them to experiment for themselves.

M.R.Ry. R. M. Ambalavana Pillai, Tahsildar of Sátúr.

(*a*) Saidápet students are from all classes.

(*c*) Their object is Government service and preferential claims for promotion.

(*e*) Agricultural education, especially practical, should be given even in pial schools, which should be compulsory for examinations.

(*f*) Experimental farms at every taluk head-quarters are needed for demonstration to ryots.

(*g*) School farms are necessary.

M.R.Ry. R. Anantarama Iyer, Deputy Collector, Tinnevelly.

(*c*) and (*d*) Saidápet candidates desire public service and are unlikely to devote their attention to agriculture; when otherwise employed they will soon forget their knowledge. They have, however, had no chance of superintending farms or agricultural schools as such have not been started. As Stock Inspectors, their effect is minimized by the immensity of their charge, viz., a whole district. Saidápet graduates are not sought by landholders as their training is unpractical and unconnected with up-country conditions; no ryot will accept them as teachers of his sons who require practical and manual training in the daily work of the farm.

(*e*) In high schools, agriculture may be an optional branch, also in urban middle schools. In rural, primary and secondary schools, agriculture may be largely taught. In district normal schools much stress should be laid on agricultural training.

(*f*) Experimental farms are most desirable, but must not be expected to pay financially. These will suggest ideas to the ryots and serve as places of practice for students.

M.R.Ry. R. Raman Unni Nayar.

(*a*) Lads who fail in the University betake themselves to Saidápet when unfitted for manual labor.

(*b*) Students should therefore be selected from the landholding class only.

(*d*) Saidápet graduates have as yet done little, nor is anything to be expected of the present class.

(*e*) The avowed object of English schools is Government service. Elementary education should be given in the vernacular at district agricultural schools in various localities; should be begun in the primary schools and end in the district schools.

(*g*) School farms should be attached to each district school.

M.R.Ry. V. Chappu Menon, Deputy Collector.

(*a*) and (*b*) Saidápet students are selected from rich and poor, preference being given according to education and their status as landholders.

(*d*) Five or six have been sent from Malabar without practical good except from Stock Inspectors. Before selection candidates always profess an interest in agriculture which, however, does not endure.

(*f*) and (*i*) Experimental farms, with classes for instruction and suitable text-books, would be useful.

S. H. Wynne, Esq., Collector of South Canara.

(*a*) Generally men of inferior capability, and unable to obtain Government employment in the ordinary way, have recourse to Saidápet. There are few applicants.

(*d*) The results to themselves as agriculturists and to agriculture are *nil*; when employed, they dislike rural work and prefer a desk at an office in a big town.

Mir Shujaat Ali Khan, Esq., Head Assistant Collector, South Canara.

(*a*) Has sent, and also known several youths, to Saidápet; all were drawn from the class following learned professions.

(*c*) Their object is to get Government service.

(*d*) Has had five Saidápet graduates under him, selected them, so that their agricultural knowledge might be useful when in service, and specially considered their education in appointing or promoting them. Considers the result of their education on agricultural progress to be *nil*, but attributes this to the conservatism of the ryot.

(*e*) Objects to agricultural education to non-agriculturists as in High and Middle schools which are seldom attended by ryots' sons. Agriculture should be taught in primary schools, if competent teachers can be found; should be compulsory in district normal schools.

(*f*) Objects to experimental farms.

(*g*) But would have a school farm or garden whenever agriculture is taught. Government pecuniary aid would probably be required whether in the shape of more liberal payments in the Grant-in-Aid Code or otherwise.

M.R.Ry. J. Sriranga Rajah, Tinnevelly.

(*a*) Large landholders are scarcely represented at Saidápet; though most agriculturists being ignorant of English and the advantages of a high agricultural education, they are even ignorant of the existence of the college, which, moreover, is an innovation. Parents also doubt whether a college can teach anything in the art which their sons do not know.

(*b*) Collectors should select the most eligible from their applicants, who usually expect Government service. Young Revenue Inspectors are also sent. In future men of the farming classes who will become farmers at the end of their course should be selected.

(*c*) Believes that the Government policy is to use graduates as agricultural agents and not to train them as farmers; considers this to be the best policy, as such agents will have wider influence than a single practical example of good farming. The objects of the applicants are chiefly to get revenue posts; a very few in the hope of becoming real agriculturists; others prefer the college course to that of the University as a mental training; some parents consider it a cheap method of giving their children a city polish in manners and habits; 75 per cent. however expect revenue posts.

(*d*) Students' intellects, manners and habits are improved. The course of training in science is far superior to the art's course. Such men must be of some benefit, though it may not be apparent. They do not become farmers if they have better prospects elsewhere, and the family lands are often not available.

(*e*) Elementary agricultural education is much required. Refers to the expenditure in other countries on agricultural education and to the fact that the great bulk of the Indian population is agricultural. Agriculture should be compulsory in Middle and High schools.

(*f*) Mentions the objects of experimental farms. Deplores the closing of the Saidápet farm and would reopen it. Considers that one farm at the Presidency town is all that can now be opened.

(*g*) A school garden should be attached to each school teaching agriculture; this is now being actually started in Ceylon by the Educational Department. At primary schools, agriculture should be taught in object lessons together with natural history, &c.

(*h*) Observes that argument and lecturing are useless; *practical* examples are necessary with other inducements. Good instructors must be appointed for the various schools.

(*i*) Text-books must be simple and deal in one part with principles, in the other with practical suggestions. A committee of experts should deal with the subject

Believes that science can do as much for primitive Indian agriculture as it has done in Europe, and that good agriculturists may be trained as well as lawyers, doctors, engineers, and with much greater results.

M.R.Ry. N. Ganapathi Pillai, Manager, Etaiyápuram Estate.

Present agricultural education inadequate; of limited influences.

(*c*) The men attend the college not for agriculture, but to get Government service or good promotion.

(*d*) A college is of limited influences.

(*e*) Elementary agricultural education should be compulsory in all schools from the lowest primary class. Proficiency should be rewarded in every way.

(*f*) Experimental farms would be too expensive.

(*g*) School teachers should take their pupils into the neighbouring fields for practical work, which the ryots would allow since it would benefit them.

(*h*) If made a condition for public service, all will take to it. Would add an Agricultural Chair to the University. Veterinary art should also be taught at the Medical College, and the Local Fund Medical officers should also be veterinary practitioners.

(*i*) Rewards should be offered for suitable text-books.

M.R.Ry. S. Sesha Aiyangar, Nagercoil.

(*a*) Candidates from all classes may be sent to Saidápet; but the sons of big landholders would be best.

(*b*) The candidate should be selected after due inquiry by the Collector, Tahsildar, the village headman, and the District Board.

(*c*) Believes that the object of their being sent would be the improvement of agriculture; it was so at least in his case (his son is a Saidápet graduate); some of course desire Government service.

(*d*) Much good would result to agriculture from their education.

(*e*) Fully approves of all the suggestions. Further, suggests that elementary agricultural education should be given in grant-in-aid village schools; agriculture should be taught also in private village schools. Suggests that agricultural implements, made into toys, should be played by children.

(*f*) Experimental farms and stations are necessary for agricultural prosperity.

(*g*) Educational farms or gardens, school farms and farm schools are all necessary.

(*h*) Exhibitions, farms, lectures, education, successful demonstration farms are all necessary to make agricultural education really practical and popular.

(*i*) Easy class-books on agriculture should be published both in English and vernacular. Robertson's class-book on agriculture is a very useful one.

M.R.Ry. Perumal Mudaliar, Alwarkurchi, Ambásamudram.

(*b*) They are selected by Collectors.

(*c*) Their object is to get Government service.

(*d*) Saidápet graduates are useful, as they give valuable advice to the ryots in agricultural matters and in the treatment of cattle-diseases. Saidápet graduates should give advice to ryots wherever they meet them and thus promote agriculture.

His acquaintance with a Stock Inspector led him to visit Saidápet where he remained for six months observing the operations on the farm. The result was that he purchased ten improved ploughs, which he has been using for the last five or six years.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

(*c*) Their best endeavour is to become a public servant.

(*d*) Most of the Saidápet graduates are not of much use; they cannot reduce to practice what they have learnt for want of sufficient capital and lands. Much good would come out if the sons of poligars, zemindars and wealthiest landlords are induced to study in the College or District Agricultural school.

(*e*) Agriculture must be compulsory for the Middle school and upwards.

(*f*) and (*g*) A farm should be established at the head-quarters of each district and managed by a board of agriculture, consisting of the Collector (President), zemindars and wealthy landholders. An agricultural school should be attached to the farm; this will do for the present..

(*i*) Text-books should be written in English and the Vernaculars.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

(*a*) Persons too poor to study for the University often resort to Saidápet; the majority had not the preliminary education necessary to understand the college lectures.

(*b*) The selection was, originally, by an examination at the college, now partly left to Collectors. Collectors, indifferent in selecting candidates.

(*c*) Students consider Saidápet as a stepping stone to Government service.

(*d*) Saidápet graduates are doing good as officials, *e.g.*, Forest Department; Mysore Government has recorded its appreciation As agriculturists, they are doing very well in Bombay and Northern Provinces, solitary instances in Madras; their influence on general agriculture is not much.

(*e*) No appreciable agricultural education is given outside the college.

(*f*) Experimental farms or stations may do good as model farms.

(*g*) Educational farms or gardens attached to schools are desirable for illustration alone; commercial farming should not be attempted in them.

(*h*) Agricultural education should be made compulsory from the very beginning. Elementary education should proceed side by side with agricultural education.

(*i*) Suitable text-books are wanting, but may be prepared from existing materials. Has prepared a text-book on agriculture suited to the Middle and High schools, but has not published it for want of demand.

M.R.Ry. C. K. Subba Row, Sub-Assistant Director of Agriculture.

His views on agricultural education are incorporated in the answers submitted by the passed students of the college.

M.R.Ry. Nataraja Pillai, South Arcot.

(*c*) The object of the candidates is to get Government posts.

(*d*) Saidápet graduates do not turn out farmers, and are seen only as public servants. Mofussil agriculture has not benefited by them.

(*e*) Agricultural education should be largely given in all the schools named.

(*f*) Experimental farms and stations are highly necessary to induce the ryots to adopt improvements.

(*g*) School farms and gardens are also necessary.

(*h*) Agricultural education should be given only to sons of farmers, as they alone could be benefited by it.

M.R.Ry. N. Vasudeva Row, Ryot of Nellore.

(*f*) Above all, the immediate establishment of Government experimental farms in important centres of each district is a matter of the greatest importance; such farms should demonstrate the improved methods and must be superintended by Saidápet graduates. The farm-operation should be conducted before a gathering of the neighbouring ryots, with explanatory instructions. Lectures might be given and tracts distributed. Revenue officers should be made to take special interest in the matter. The farm should be in itself a society and a laboratory. The farm will thus be an ideal for the farmer. Systematic work for five years or so would produce wonderful results. The system may be extended to schools by offering grants and prizes for teachers and pupils for the best experiment with the ordinary crops.

Q. VIII.—Agricultural Inquiry.

Methods, present defects and future development.

Q. IX.—Private Effort, Inquiry and Experiment.

(*a*) Their origin and existence, if any, especially among the richer landholders
(*b*) Their present and proper direction.
(*c*) The best method of fostering them.
(*d*) The devotion of capital—
(1) to new improvements,
(2) to the ordinary operations of agriculture.

Tahsildar of Ráyadrúg.

IX. Only Mr. Sabapathy Mudaliar has taken any steps towards inquiry and experiment. Results not stated.

M.R.Ry. C. Hanumanta Goud, Hospet.

VIII. Agriculture not being profitable, landlords lease out their land and don't cultivate it themselves.

Karnam of Kanchikera and Reddi of Uchangidrug.

IX. Private agricultural inquiry and experiment are *nil*. Education is first required.

M.R.Ry. J. Sreenivasa Row, Pleader, Gooty.

IX. No private effort in inquiry and experiment in this district.

M.R.Ry. P. Subba Row, Anantapur.

IX. Poverty prevents private experiment, but even rich landholders cultivate like poor men and make no attempt towards improvement.

Dewan Bahadur R. Ragunatha Row, Madras.

VIII. The statements of respectable landlords may be relied on.

Hon'ble S. Subbramania Iyer, Madras.

IX. (*c*) and (*d*). Private effort in devoting capital to improvement is checked by the liability to re-assessment every 30 years. Capital will be less and less devoted until settlement principles are more intelligible.

M.R.Ry. V. Parthasaradhi Iyengar, Deputy Collector, Chingleput.

IX. (*a*) Private inquiry and experiment do not exist.
(*c*) The department should, therefore, secure the aid of the more intelligent and wealthy native landholders, who understand usages and habits of the ryots and the reasons for local practices; on such a foundation future action should be based.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

VIII. No systematic inquiry exists at present.

M.R.Ry. A. P. Thandavaraya Pillai, Ayampolliem, Trichinopoly.

VIII. The committee should inquire of the regular agricultural class.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector, Madura.

VIII. Inquiry should comprise complete examination of all existing methods, an analysis of the various soils, and the ascertainment of all available manural substances. The results of such an inquiry with suggestions for improvement should be widely disseminated in simple language both amongst the ryots and in the schools.

IX. Men like Mr. Krishnasami Mudaliar of Shiyáli should be encouraged by honorary titles.

M.R.Ry. M. R. Ramakrishna Iyer, Tinnevelly.

VIII. A separate department is necessary; proper inquiry can only thus be carried out.

IX. (*c*) If private experiments are put in hand, agricultural experts, who have special knowledge of the particular class of experiments, should be deputed to aid and supervise them.

M.R.Ry. N. Ganapathi Pillai, Manager, Etaiyápuram Estate.

IX. (*a*) Mentions the failure for want of proper supervision, &c., of a model farm at Etaiyápuram when under the Court of Wards.

VIII. Agricultural inquiry should enter into the present methods of cultivation and their defects and suggest the best methods of improving them.

M.R.Ry. S. Sesha Aiyangar, Nagercoil.

IX. (*a*) There is no spirit of inquiry among the ryots; all move in ancestral grooves. He and his son Swami Aiyangar are making agricultural inquiry in Travancore and Tinnevelly district, also in other districts. Messrs. Krishnasami Mudaliar of Shiyáli and Sabapathy Mudaliar of Bellary conducted agricultural inquiry and experiment. Mr. M. Ramakrishna Iyer of Tinnevelly has begun.

(*b*) Rich landlords are averse to inquiry and experiment; follow ancestral methods.

(*c*) Government should always aid and encourage private efforts. Complains of the non-appreciation by Government of the efforts of himself and his son in the improvement of agriculture, and fears even the little enterprise will die out under such feeble patronage.

(*d*) (1) There is no capital to invest in new improvements.

(2) Capital is devoted to a small extent to ordinary operations.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

VIII. There is no systematic agricultural inquiry at present; District Manuals contain some information. Government should award prizes for the best agricultural history of each district, showing the present defects and future developments of agriculture; this in time will lead to a complete agricultural inquiry for the whole Presidency.

IX. (*a*) Private effort, &c., is *nil* at present.

(*c*) The intelligent ryots should be invited to meet, at a fixed time, in the District farm and discuss agricultural questions.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

IX. There is no private inquiry, except a beginning made by Messrs. Sesha Ayangar, Krishnaswami Mudaliar, Sabapathy Mudaliar; the results, unknown. The landholders are bound by custom and will not inquire.

M.R.Ry. C. K. Subba Row, Sub-Assistant Director of Agriculture.

VIII. Recommends the location of Agricultural Inspectors in groups of villages to guide the ryots in carrying out the improvements proved to demonstration at Saidápet. The Inspectors should also record all interesting matters in prescribed forms so as to show clearly and definitely the advantages of the new methods. It is possible to obtain exhaustive information on agricultural matters by addressing questions in vernaculars to the landholders. The Agricultural Inspectors who should be relieved of the analysis work may then be utilized to help the ryots in introducing the improvements.

M.R.Ry. Nataraja Pillai, South Arcot.

VIII. There appears to be no agricultural inquiry at present. Agricultural Inspectors should be permanently located in parts to conduct inquiry and offer advice.

Q. X.—Agricultural Societies or Clubs.

(*a*) Their existence, origin, scope, actual operations, success or failure, defects.

(*b*) Suggestions for their origination or improvement, *e.g.*, by affiliation to a Central Board, bureau or society, by local development, by Government pecuniary aid or other stimulus.

Tahsildar of Ráydrug.

(*a*) and (*b*) No association exists, nor would succeed unless it grants pecuniary aid. The ryot works for the usurer, not for himself, usually upon the standing crop when thriving; loan

to be repaid on terms very favorable to the lender; is wholly in the usurer's hands for old and current loans. Twenty-four per cent. is the lowest rate of interest. Hence any association for lending purposes at moderate rates is most desirable, but Government guarantee would be necessary to induce capitalists.

Rev. E. Lewis, Bellary.

(*b*) A central society with local branches would be fruitful in suggestions and in fairly united action towards improvements. Mutual suspicion now bars improvement.

M.R.Ry. C. Hanumanta Goud, Hospet.

(*a*) A society was formed at Hospet, but died out when the Stock Inspector, who promoted it, was transferred.

(*b*) Agricultural societies could be formed at all principal centres, if competent *practical* men could take part.

Karnam of Kanchikera and Reddi of Uchangidrug.

X. Societies do not exist, but would do much good if numerous and associated.

Tahsildar of Dharmavaram.

(*b*) Would have numerous agricultural societies utilizing District, Taluk and Punchayat members.

M.R.Ry. J. Sreenivasa Rao, Pleader, Gooty.

(*b*) Societies for inquiry, experiment and suggestion very desirable. Government aid by money grants and by honorary titles to zealous members would be very stimulating.

M.R.Ry. P. Subba Rao, Anantapur.

(*b*) District not yet ready for agricultural clubs; people must first become interested in improvements. Individual inducements and time will beget interest, but Government undertakings at its own cost may stimulate interest.

Ryots' Association, Madanapalle.

(*a*) The present association started in 1884. Objects are—

(1) Settlement of disputes amongst ryots by arbitration;
(2) Promotion of education of ryots' children;
(3) Giving advice as to cultivation and fertilization;
(4) Establishment of an agricultural museum;
(5) Establishment of an agricultural lending bank when funds are available; interest on loans not to exceed 6 per cent.

A night-school has been started for poor children. A sub-committee distributes seeds, makes experiment, and disseminates information. Agricultural periodicals are received from officials.

(*b*) The association not flourishing; would be developed if affiliated to a Central Board and officially supported. Government pecuniary aid not required. Honorary rewards to Reddies could stimulate interest in the association.

T. Ward, Esq., Madanapalle.

(*a*) Ryots' association started at Madanapalle in 1884 still exists.

(*b*) It would do good work if affiliated to a central society.

Tahsildar of Wálajápet.

(*b*) Approves of the suggestions in the interrogatory. Societies might establish experimental gardens and stations under professional supervision.

Secretary, Planters' Association, Nilgiris.

(*b*) Agricultural societies are very necessary.

Dewan Bahadur R. Runganatha Rao, Madras.

(*b*) Agricultural societies will spontaneously start if hindrances are removed (? insecurity of tenure).

M.R.Ry. V. Parthasaradhi Iyengar, Deputy Collector, Chingleput.

(*b*) Numerous agricultural associations are absolutely necessary. Wealthy proprietors, ryots, and officials should join. Government should give pecuniary aid and confer honorary titles.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

(*b*) Societies can be formed if consideration be given to their opinion.

M.R.Ry. K. Veeriah Vandiar Pundi, Tanjore.

(*b*) District societies with taluk branches desirable.

M.R.Ry. A. P. Thandavaraya Pillai, Ayampolliem, Trichinopoly.

(*b*) Societies are essential, affiliated to a central committee and presided over by the Collector, otherwise no use. Such a society must be placed in funds by Government. Honors to meritorious characters will greatly help.

G. W. Fawcett, Esq., Collector, Trichinopoly.

(*b*) Approves of the idea of agricultural societies; certain big landlords now propose to start one. Considers that affiliation to a central society might cause suspicion and be disadvantageous. Pecuniary aid should not be given, as it would strengthen the suspicion; only a self-motive body will do real work; self-interest must be the mainspring of action. A society bolstered up by Government would only talk. How to awaken self-interest is the problem. The English stimulus of necessity and competition is wanting, the tropical standard of comfort being low.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector, Madura.

(*a*) The "Madura Farmers' Club" exists only in name; the members take no interest in this.

M.R.Ry. M. R. Ramakrishna Ayar, Tinnevelly.

(*a*) The district agricultural association is not flourishing, united effort being difficult, though individual interest exists.

(*b*) Government pecuniary aid is desirable.

M.R.Ry. V. Chappu Menon, Deputy Collector, Calicut.

(*b*) A central committee should be formed at head-quarters with Collector as President and numerous natives of influence as members Taluk committees with Tahsildars as chairmen should be affiliated to this central committee. These committees should control Stock Inspectors, exhibitions, and all efforts towards agricultural improvements. District committees should be controlled and advised by experts under the Board of Revenue.

Mir Shujaat Ali Khan, Esq., Head Assistant Collector, South Canara.

(*b*) Is sceptical as to the direct effect of societies, but believes they would be useful if they worked steadily.

M.R.Ry. M. Ganapathi Pillai, Manager, Ettiápuram Estate.

(*b*) Suggests an agricultural society with a capital of two lakhs for land banking, supplying implements, keeping farms and the publication of agricultural knowledge; there should be 3 separate farms of rented lands for the three branches of cultivation; publications should include records of experiments and general information; this suggestion is the outcome of many years' thought and discussion with others who offer to co-operate. Believes he could get 2,000 subscribers; suggests affiliation to District Boards to ensure continuity. Mentions an experiment in profitable tree growing in 1870-74.

M.R.Ry. S. Seshayangar, Nagercoil.

(*a*) An agricultural association was started by Swami Aiyangar—one in Madras and one in Tinnevelly; they are now gasping for breath.

(*b*) A central board or association should be formed in Madras and should have as its members the local public-spirited men; and branch associations should be formed in each district. The central association should be supported by Government pecuniary aid and should aid the district associations. All improvements must originate in the central association.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

(*a*) There is none at present worthy of the name and useful to the country.

(*b*) A board of agriculture should be formed in each district at the head-quarters, consisting of the zemindars, poligars and rich land-owners as members, with the Collector as President, and the Board should manage the district farm; then branch societies will be formed by the intelligent land-owners in the interior of the district.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

(*a*) Saidápet Agricultural Students' Association started in 1882 was doing some work and publishing a very useful journal on agriculture; the journal has been discontinued for want of patronage; this evidences the general apathy to agriculture.

Madura Farmers' Club did something for a year or two, but unfortunately collapsed.

Q. XI.—Land Improvement.

(*a*) Present classes and methods of land improvement.
(*b*) The capital employed whether in money, stored grain or labor.
(*c*) Whether from borrowed or accumulated capital.
(*d*) The methods of borrowing, whether (1) from Government, (2) from money-lenders, (3) lending banks, (4) from Loan Associations, such as the indigenous class of lotteries, Mutual or Co-operative Loan Societies, &c.
(*e*) The interest on borrowed capital, and the classes of security offered and accepted.
(*f*) Any objections or hindrances to borrowing from Government with suggestions for improvement.

Tahsildar of Ráiyadrúg.

(*a*) Chief improvements are irrigation works and breaking up fallow.
(*b*) Usually paid for in money and by joint labor; sometimes by surplus grain.
(*d*) Money is borrowed from money-lenders, there being no banks. Six loan associations at work, five of them being in Bellary; not intended for the ryot.
(*e*) Usually money is borrowed on mortgage; 2 per cent. is the lowest interest.
(*f*) Government rules are liberal; not taken advantage of (1) because the mortgage to Government hinders further mortgages if more money is required as for marriage; (2) the loan is public and this spoils his credit with the money-lender; (3) estimate by Government officers of the work done is too low. No suggestions as to improvements.

Tahsildar of Hospet.

(*f*) Private lenders preferred to Government; publication of his private circumstances, hard and fast rules, inspection of his property and improvements, restrictions as to his mode of carrying out his improvements are objectionable to the ryot. Hence Government loans are not taken.

M.R.Ry. C. Hanumanta Goud, Hospet.

(*a*) Irrigation works and breaking up fallows are the chief improvements.
(*d*) Money for them is borrowed from sowcars. At Hospet, there is a Mutual Benefit Fund: monthly payments are required. Hence ryots cannot in general join.
(*e*) Sowcars' interest is 12 per cent. on jewels, up to 18 on lands, and up to 24 to 30 for other security.
(*f*) Against Government loans are (1) long delays, (2) difficulty of access to officials, (3) fear that the whole sum will not reach the borrower, (4) fears as to repayment. Would grant loans by a committee of officials and non-officials; money to be paid over by the Divisional officer in person; ryots to be encouraged to see the Collector and Divisional officers; loans to be granted for other purposes than those in the rules.

Kurnam of Kanchikera and Reddi of Uchangidrug.

(*a*) Land improvements are clearance of fallow and works of irrigation and surface drainage.
(*b*) Rich men use their own money; poor men borrow.
(*e*) Interest is 1½ to 2 per cent. per month, on mortgages only.
(*f*) Government money can only be used for a specific object and not as the ryot pleases; poor ryots already under mortgages are unable to borrow from Government; these are the objections to Government loans.

Tahsildar of Dharmavaram.

(*a*) Improvements chiefly irrigational.
(*c*) Partly on capital borrowed.
(*e*) On mortgages at 12 per cent. and higher interest.
(*f*) Government rules for loans too rigid to suit the ryot.

M.R.Ry. J. Sreenivasa Row, Pleader, Gooty.

(*a*) Breaking up fallow block land the chief improvement.
(*c*) Capital borrowed.
(*e*) From 12 to 24 per cent.
(*f*) The only objection to borrowing from Government is that the whole money does not reach him.

Tahsildar of Hindupur.

(*f*) Objections to Government loans are (1) publicity which affects his credit, (2) rigidity of the rules as to the use and repayment of the money.

M.R.Ry. P. Subba Row, Anantapur.

(*a*) Ruined tanks may be privately repaired; other irrigation works are sought for by the ryots.

(*d*) Money is borrowed by the poor for improvements, either from Government or money-lenders.

(*e*) Private loans, if large, pay 12 to 15 per cent.; if small, 15 to 24 per cent.

(*f*) Delay and tedious inquiry prevent application to Government. Government might accept substantial personal security. The cowle system for breaking up fallow might be revived.

Ryots' Association, Madanapalle.

(*b*) Generally borrowed from money-lenders for land improvements.

(*e*) At 12 per cent. on mortgages.

(*f*) Loans from money-lenders are applicable to all purposes; Government loans only to land improvement. Moreover the Government mortgage bars further private loans.

Tahsildar of Wálajápet.

(*a*) Chief improvements are breaking up fallows and irrigational. Poverty and indifference prevent much improvement.

(*e*) Private interest is 12 per cent. to 24, on mortages of land and jewels; loans are rarely given without such security.

(*f*) Private loans are preferred to Government loans as there is no restriction in using the money; rules for repayment are more elastic. Government rules might be modified by putting off interest and by demanding payment at good harvest seasons.

M.R.Ry. C. Ramaswami Reddi, Vakil, Vellore.
M.R.Ry. C. Subbramania Reddi, Vakil, Chittoor.

(*f*) Poverty prevents attempts at improvement. Government agricultural banks would therefore be a great aid.

Tahsildar of Námakal.

(*a*) Chief improvement is well sinking.

(*c*) Mostly on private loans.

(*f*) Seldom from Government owing to rigor of rules. Would recommend reduction of interest and longer terms for repayment.

Tahsildar of Atúr, Salem District.

(*a*) Wells and breaking up fallow are the chief improvements.

(*c*) On loans borrowed.

(*e*) At from 12 to 24 per cent.

(*f*) Government loans objected to on account of rigidity of the demand for repayment and of the rules regarding the application of the loan. Suggests greater elasticity in the rules for repayment by solvent borrowers.

J. H. A. Tremenheere, Esq., Acting Collector of Coimbatore.

(*a*) Capital for development not wanting. Durkhast system is obstructive; in settled districts, lands should be given to first applicant, on applying to a land registration office; adjacent claims should not be considered. Bribes to various officials and the cost of durkhast appeals run to a considerable sum.

(*f*) Government loans can be given if Tahsildars' apathy is overcome.

Secretary, Planters' Association, Nilgiris.

(*f*) Money borrowed from Government is said to be largely clipped into before it reaches the borrower. Money should be advanced by the Collector. Suspicions as to Government intentions also stand in the way.

J. Steavenson, Esq., Madras.

(*f*) The belief in the necessity for gratuities to subordinates prevents recourse to Government loans. District officers could do much to encourage such loans.

Dewan Bahadur R. Runganatha Row, Madras.

(*a*) No improvements are possible so long as the holder is not sure that the land is his own. It is not want of capital or want of borrowing facilities that bar improvements.

(*f*) Government loans are not taken, because the rules are more disadvantageous than those of the "worst usurer."

M.R.Ry. P. Theagaraya Chettiar, Madras.

(*f*) The chief objection to Government loans is that money is not fully received by the borrowers. The issue by Taluk Boards will minimize this objection.

Local Boards may be utilized as money-lending agencies; recoveries on loans should be 12 per cent., 4 per cent. going for interest and 8 per cent. to sinking fund; in a few years principal and interest will be paid off.

Hon'ble S. Subbramania Aiyar, Madras.

(*f*) Objections to Government loans are the delays and expenses attending them. Special officers of the grade of Deputy Collectors should be deputed to make the necessary explanations, inquiries and advances.

M.R.Ry. P. Rangiah Naidu, Zemindar, Chingleput.

(*f*) Local Fund Board may be granted funds to lend to ryots for improvements at not more than 4 per cent. interest, but on good security; interest payable half-yearly and only after two years; 8 per cent. per annum to be also collected for repayment of principal.

M.R.Ry. V. Parthasaradhi Aiyangar, Deputy Collector, Chingleput.

(*a*) Improvements feeble and chiefly irrigational.
(*c*) Money is often borrowed for the purpose.
(*e*) Interest, 12 to 15 per cent.
(*f*) Government loans require tedious inquiry and do not fully reach the ryot.

M.R.Ry. Narainaswami Nainar, Gingee.

(*a*) Land improvements few and defective.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

(*a*) Improvements are almost *nil*.
(*f*) Trouble, delay and the fear of magisterial power prevent recourse to Government loans. Tahsildars should therefore not be Magistrates.

H. Sewell, Esq., Collector of South Arcot.

(*f*) Punctual repayment is the chief objection to Government loans; the ryot prefers the power to renew, even on ruinous conditions; delays are also an obstacle, but are hardly avoidable.

M.R.Ry. K. Veeriah Vandiar Pundi, Tanjore.

(*b*) Improvements are made by personal labor, by private means or by loans.
(*e*) Interest at 7½ to 12 per cent.
(*f*) Private loans preferred to Government, as the rules for repayment are elastic. Repayment more at the borrower's convenience will induce application to Government.

M.R.Ry. A. P. Thandavaraya Pillai, Ayampolliem, Trichinopoly.

(*c*) Capital is much wanted; the miseries caused by borrowing from money-lenders would occupy volumes. Most of the ryots' income is swallowed up by Government demand, stamp-duties, &c.
(*e*) Interest equal to nearly 72 per cent. per annum; no security is taken; this is for men without security.

G. W. Fawcett, Esq., Collector of Trichinopoly.

(*c*) Generally on capital borrowed.
(*e*) At not less than 12 per cent.
(*f*) Does not believe that the conditions of Government loans prevent borrowing. Money-lender is preferred as being close at hand and well acquainted with the ryot. Considers that the remedy is in sending the Tahsildar to the ryot, instead of the converse.

M.R.Ry. T. Ranga Row, Deputy Collector, Madura.

(*c*) From knowledge of North India and Bombay is inclined to believe the sowcar to be an essential and useful element in the ryotwari system; it is through him that capital is largely invested in the soil; the ryot and the sowcar are mutually inter-dependent; even though he ousts the peasants, he replaces the pauper by the capitalist.
(*f*) Government conditions for loan are too inelastic and tedious; hence resort to the sowcar.

J. Thomson, Esq., Collector, Tinnevelly.

(*f*) The objections to Government loans are (1) that the rate of interest is as high as that of private money-lenders, (2) that the rules for repayment are too rigid.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector, Madura.

(*a*) and (*c*) Considerable improvements are generally effected by loans from money-lenders.
(*d*) Mutual loan associations or lotteries exist, but not usually for such purposes.

(*f*) The scrutiny and rigidity necessary for Government loans prevent application. Money-lenders charge higher rates than Government, because they run greater risks and are more elastic in their condition. It is impossible for Tahsildars burdened with Magisterial work to devote attention to such matters, and their relief from magisterial work is desirable.

M.R.Ry. M. R. Ramakrishna Ayar, Tinnevelly.

(*f*) Government loans are not resorted to, partly because the ryots are not aware of the Government offers. Instalments should be collected after harvest, with indulgence in case of short crops.

M.R.Ry. R. M. Ambalavana Pillai, Tahsildar of Sátúr, Tinnevelly.

(*e*) Interest on private loans, upon mortgages is 12 per cent. within Rs. 250, 7½ to 9 per cent. below Rs. 1,000, 5 or 6 per cent. below Rs. 5,000, 4½ per cent. for larger sums.
(*f*) The necessary Government formalities are considerable and rules inelastic. Loans without interest may be given for sinking wells. The remission of assessment for even 20 years will not stimulate wells on dry land, as the assessment is very low and the cost of a well very high. On wet lands, it would be a considerable inducement.

M.R.Ry. R. Anantarama Ayar, Deputy Collector, Tinnevelly.

(*a*) Wells are the chief improvements and under the influence of the Government principle of not taxing private outlay have converted miserable patches into flourishing gardens.
(*c*) Improvements are made from capital. Has never met with cases of private loans for such purposes; the dangers of borrowing are well understood; the class who would improve lands would put off improvements rather than encumber their property.
(*d*) Loan associations have increased, but the banks are only resorted to by traders; money-lenders lend money; other methods of usury are common; land-holders are often in debt to their tenants who enjoy the lands until discharge of debts (ulavudai mortgage).
(*e*) Money-lenders seldom charge less than 12 per cent. and compound interest as usual, as shown by the ledgers upon the entries in which renewed bonds are based. Interest is frequently paid in grain upon loans in grain.
(*f*) Objections to Government loans are (1) publicity, (2) inability to further charge the land owing to the priority of the Government claim, (3) punctuality of demand, (4) *morcellement* of estate, so that the well ayakat available is insufficient. Would recommend less publicity and more elasticity in repayment.

H. M. Winterbotham, Esq., Collector, Malabar.

(*a*) The actual cultivator cannot go in for land improvement till they get fixity of tenure and freedom from cruel rack-renting to which they are now exposed.

M.R.Ry. K. Raman Unni Nayar, Malabar.

(*a*) Improvements are made either by proprietors or by those who have leases for 12 years, chiefly in reclaiming jungle tracts, supplying irrigation, planting, &c.
(*b*) Expenditure in land improvement is always made in grain.
(*c*) Capital sometimes obtained by lotteries, in which case no interest is paid.
(*e*) Interest paid on grain will amount to 20 to 30 per cent, or money 9 to 12 per cent.
(*f*) Government loans are disliked by reason of various annoyances.

M.R.Ry. V. Chappu Menon, Deputy Collector.

(*a*) Uncertainty of tenure and low rates of compensation for disturbance have checked improvements; higher rates being now allowed, new impulse has been given.

Mir Shujaat Ali Khan, Esq., Head Assistant Collector, South Canara.

(*a*) Enumerates eight classes of land improvement.
(*e*) Interest is generally from 3 to 6 per cent. (per annum ?). Has never known it higher than 6 per cent. on loans for land improvement.
(*f*) Objections to Government loans are high interest, worry and expense to ryots by lower officials, inelasticity and stringency of conditions. Can suggest no remedies.

M.R.Ry. S. Sesha Aiyangar, Nagercoil, Tinnevelly.

(*b*) Both in money, stored grain or labour.
(*c*) All improvements must be made from loans, as the ryots have generally no capital.
(*d*) (1) Government must advance money.
(2) Private loans are useless, as the interest is exorbitant.
(3) Similarly in lending banks.
(4) Mutual or Co-operative Loan Associations would be very beneficial.
(*e*) Generally 12 per cent. per annum; minimum is 9 per cent. and the maximum 24 per cent. The security consists of lands, houses and jewels.
(*f*) The poverty of Government is the only obstacle to borrowing from it. Government must, however, lend money at a low interest to the ryots.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

(*a*) People in general do not care for land improvement, as agriculture is not sufficiently remunerative.
(*e*) 12 to 18 per cent. per annum, generally on the security of the landed or personal property.
(*f*) If agriculture is made more paying, the ryots will no doubt avail themselves of the liberal loans of Government.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

(*a*) Improvements are made only when absolutely necessary, such as levelling, enlarging bunds and banks, reservoir (in wet lands), well-digging (in garden lands).
(*b*) (*d*) the ryot borrows his capital from money-lenders.
(*e*) At exorbitant interest on the security of the land and its produce raised and to be raised.
(*f*) Seldom borrowed from Government, the rules being very stringent.

M.R.Ry. P. Basavanna Goud, Patel of Amidali village.

(*f*) The present rules of Government advances are good. If Government would advance money at a low interest for purchasing ploughs, sinking wells, and protecting cattle, the condition of the ryot and the land will be greatly improved.

M.R.Ry. Venkata Reddi, Narnur, Rámallakót.

(*a*) Construction of tanks, canals and wells, &c., would improve the lands.
(*b*) If Government should advance money without interest, the construction of tanks, &c., would be made easy.

M.R.Ry. N. Vasudeva Row, Ryot of Nellore.

(*a*) Well-digging is the only land improvement, popularly understood.
(*f*) Ignorance of the liberal loans of Government prevents borrowing. Special officers should be appointed to give publicity to the Acts and to grant loans.
(*g*) The ryot is under the thumb of the Sowcar. The system of kistbandy should be improved. The recent reduction in the amount of the Savings Bank Deposit may somewhat induce private capitalists to open Loan Societies.

Q. XII.—Irrigation Wells.

(*a*) Any special difficulties in digging and working wells.
(*b*) Suggestions for developing well-digging; as for instance, by the total remission for a term of years of the assessment of the land irrigated.

Tahsildar of Ráiyadrúg.

(*b*) Well-digging might be facilitated by total remission of assessment for a term of years.

Tahsildar of Hospet.

(*a*) Wells are so expensive in hard soil that the profit is incommensurate with the expenditure.

M.R.Ry. C. Hanumanta Gowd, Hospet.

(*a*) Uncertainty of finding a spring and want of proper water-lift or pump are against wells.

(*b*) Assessment might be remitted for a year or two till the land is ripe for growing garden crops.

Kurnam of Kanchikera and Reddi of Uchangidrug.

(*b*) Useless to grant remission for a term of years for the ayakat of wells; the present methods of granting loans at low interest and recovering by an annual charge on the ayakat is sufficient.

Tahsildar of Dharmavaram.

(*a*) Improved water-lifts much required; present lift being expensive, swallows up profits.
(*b*) Assessment is so trifling that its remission would be no inducement to well-digging.

M.R.Ry. P. P. Rajagopalachariar, Deputy Collector, Gooty.

(*a*) Not dug, because of difficulty and cost.
(*b*) Present inducements to dig wells sufficient.

M.R.Ry. J. Sreenivasa Row, Pleader, Gooty.

(*a*) Want of capital prevents well-digging.
(*b*) The present takkavi system is good. Total remission of assessment may help.

Tahsildar of Hindupur.

(*a*) Present water-lifts costly.
(*b*) Wells might be dug by Government and transferred to ryot on special assessment.

M.R.Ry. P. Subba Row, Anantapur.

(*a*) Poverty prevents well-digging. Government rules though benevolent, work hard in practice; *e.g.*, the rules as to crops under wells in wet land when the tank receives a small supply at the very end of the crop; full assessment is also chargeable if only a little water is used; hence second-crop assessment is charged on the land under wells even if only a few days' water came to the tank.
(*b*) Three years' assessment might be remitted for wells in dry land. Second-crop assessment should be remitted for wells in wet land.

Ryots' Association, Madanapalle.

(*a*) No special difficulties; soil being soft, makes working dangerous.
(*b*) Remission of ten years' wet assessment and twenty years' dry would be advantageous.

Tahsildar of Wálajápet.

(*a*) Poverty alone prevents well-digging.
(*b*) Five years' remission for dry assessment, and two or three years' wet assessment might be allowed. Second-crop assessment should be struck off in the case of wells on wet lands.

Tahsildar of Námakal.

(*b*) Would recommend remission for some years upon the well ayakat.

Dr. J. Shortt, Yercaud.

(*b*) Remission of assessment for a term would encourage well-digging. Scientific assistance should be given in selecting sites.

Tahsildar of Atúr.

(*a*) Land under wells in wet land is oppressed by the rule which demands full assessment should supply be received at any time during the crop.
(*b*) Would charge only dry assessment where the supply is received too late for the crop.

J. H. A. Tremenheere, Esq., Acting Collector of Coimbatore.

(*a*) No remission is given for wells and wet land when *any* supply has been received; this should be changed.
(*b*) The well ayakat should get remission when other lands do.

J. Steavenson, Esq., Madras.

(*a*) Well-digging most advantageous, but the margin of profit is often too small to encourage them when markets are difficult.

Dewan Bahadur R. Rangunatha Row, Madras.

(*a*) Recent Government rules are very unwise; wells will not be sunk so long as the practical result is increase in the land-tax by reason of the ryot's own improvement.

M.R.Ry. P. Thsagaraya Chettiar, Madras.

(*b*) Remission of assessment from one to three years, and facilities for brick-burning and stone-quarrying will stimulate well-digging.

J. Lee-Warner, Esq., Collector of Chingleput.

(*b*) Irrigation under wells should be free of all suspicion of extra charge.

M.R.Ry. V. Parthasaradhi Iyengar, Deputy Collector of Chingleput.

(*b*) Reduction or remission of assessment would be beneficial.

M.R.Ry. Narainaswami Nainar, Gingee.

(*b*) Considers that efficient water-lifts should be introduced.

M.R.Ry. S. Devanayagam Mudaliar, Cuddalore.

(*a*) The only drawback to well-digging is that Government oppressively levies an additional tax for this or any other improvement.

M. R. Ry. A. P, Thandavaraya Pillai, Ayampolliem, Trichinopoly.

(*b*) Irrigation wells will be encouraged by remission of wet assessment or a grant of half the cost.

G. W. Fawcett, Esq., Collector of Trichinopoly.

(*b*) Is not of opinion that remission of assessment would induce well-digging in dry lands, unless for a very long term of years, as the amount would otherwise be insignificant. On wet lands remission for ten years would suffice, but would prefer to encourage wells in wet lands by exempting them from all charges for water.

C. H. Mounsey, Esq., Sub-Collector of Madura.

(*b*) Considers the present inducements to well-digging, viz., Government loans on easy terms, to be sufficient. Official energy and avoidance of delay are, however, requisite. Has already lent Rs. 15,000 this year in the Palni taluk alone.

M.R.Ry. T. Ranga Row, Deputy Collector of Madura.

(*b*) All wells should be exempt from assessment, being dug from private resources.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector of Madura.

(*a*) Want of capital and of a margin of profit are the only obstacles against well-digging.
(*b*) Objects to remit the assessment on the well ayakat; considers the present rules for loans sufficient.

M.R.Ry. M. R. Ramakrishna Aiyar, Tinnevelly.

(*b*) Recommends boring apparatus and remission of assessment for a period in dry taluks.

M.R.Ry. K. Annaswami Ayer,
M.R.Ry. A. Somasundaram Pillai, } *Tinnevelly.*

(*b*) Wells should be encouraged by loans at 5 per cent, payable in 15 instalments, upon the security simply of the well ayakat. Localities should be scientifically selected at Government expense.

M.R.Ry. R. Anantarama Iyer, Deputy Collector of Tinnevelly.

(*b*) Does not approve of temporary remission of assessment since Government loans are not objected to for pecuniary reasons; the interest in fact is "as good as charity;" all that is required is to reduce publicity and render repayment more elastic.

M.R.Ry. N. Ganapathi Pillai, Manager, Etaiyápuram State.

(*b*) All necessary stimulus to well-digging has been given by the Government decision not to tax improvements effected at private cost; this has been followed in Etaiyápuram.

M.R.Ry. S. Sesha Aiyangar, Nagercoil.

(*a*) The cost of digging and lifting water and the uncertainty of finding out springs are the only difficulties.
(*b*) Remission of assessment for 10 or 15 years would develope well-digging.

Rai Bahadur, T. Rajaram Row, Deputy Collector, Madura.

(*b*) Development of wells would be very advantageous. A total remission of assessment of the land irrigated would certainly stimulate well-digging. A reduced assessment should also be charged in after years, as well-irrigation is laborious and expensive. To construct a pucka well would cost Rs. 150 and upwards.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

(*a*) Want of capital and the high assessment on garden lands prevent well-digging.
(*b*) Government must not try to appropriate any share of the profits, but must allow the ryot to enjoy the full benefit of his *own* improvement.

M.R.Ry. P. Basavanna Goud, Patel of Amidali village.

(*a*) It is impossible to sink wells in clay-soils.
(*b*) Well-digging might be developed by total remission for 10 or 15 years.

M.R.Ry. Venkata Reddi, Narnur, Rámallakót.

(*a*) Well-digging is difficult, the ground being rocky.
(*b*) Remission of assessment might improve well-digging.

M. R. Weld, Esq., District Judge, Ganjam.

(*b*) The remission of the assessment for a period would certainly develop well-digging, but if effective steps were taken to prevent the robbing of the ryot who digs a well by the imposition of "fasaljasti" and "tirwajasti," well-digging will progress with no further incentives; the well is the work of the ryots' hands and its profits should be absolutely secured to him. Hears that matters have been improved in this respect.

M.R.Ry. Nataraja Pillai, South Arcot.

The want of an efficient water-lift is greatly felt; the ordinary picotta is the only one available, but is dangerous and difficult.

M.R.Ry. N. Vasudeva Row, Ryot of Nellore.

(*a*) The difficulties in well-digging are—
(1) The poverty of ryots
(2) Ignorance of surface springs.
(*b*) A professional body should survey the Presidency and classify the tracts containing surface-springs and make them known to the ryots.

Q. XIII.—Other Industries.

(*a*) The existence, status and present condition of village industries.
(*b*) Suggestions for their improvement and development.
(*c*) The development of new industries suitable to the locality.
General Remarks.

Rev. E. Lewis, Bellary.

(*a*) Rural industries are at a low ebb; towns take the best artisans; weaving is on the decline.
(*b*) Associations of weavers to get new patterns and better looms with trustworthy agents for sale would improve trade. But men of energy and new business ideas are needed; at present no new business succeeds without subsidiary aid.

Tahsildar of Hospet.

General Remarks.—No benefits yet conferred on ryots by the Agricultural Department; a few seeds and ploughs are the measure of improvements hitherto; cattle and sheep not improved and few ryots resort to cattle disease inspectors.

M.R.Ry. C. Hanumanta Goud, Hospet.

(*a*) Iron working and weaving are dying from Western competition.
(*b*) The education of weavers in their art, including dyeing, might improve its status.

Karnam of Kanchekera and Reddi of Uchangidrug.

General.—No benefit has accrued to the ryots from the Agricultural Department, except the distribution of some seeds and implements, and the stock inspector is of little use, being always on the move and the ryots fear to use the medicines he gives. Breeding-bulls might be entrusted to big ryots or village headmen.

Tahsildar of Dharmavaram.

(*a*) Rural industries entirely unimproved.
(*b*) General technical education desirable.

M.R.Ry. P. Subba Row, Anantapur.

General.—Suggests undertaking of irrigation projects by Government; asserts that there are possible projects and not imaginary as supposed by superficial inquiries; such projects would achieve more than indirect efforts.

Tahsildar of Wálajápet.

(*b*) Improvement of village industries waits upon improvement in general conditions.

M.R.Ry. C. Subbramania Reddi, Vakil, Chittoor.

General.—The present Agricultural Department has not effected any perceptible benefit, nor is it likely to do so.

Dr. J. Shortt, Yercaud.

General.—Decidedly considers that the Board of Revenue should administer the Agricultural Department, which should deal with agriculture alone.

J. H. A. Tremenheere, Esq., Acting Collector, Coimbatore.

(*c*) Factory for common glass is much needed and would be remunerative on the East Coast.

General.—Strongly recommends tree-planting, such as casuarinas, on the Tinnevelly coast.

Secretary, Planters' Assosiation, Nilgiris.

General.—The Agricultural Department should not be administered by Revenue Board and should be confined to agricultural matters.

Dewan Bahadur R. Runganatha Row, Madras.

(*b*) Other industries should be encouraged simply by placing no hindrances in their way.

M.R.Ry. V. Parthasaradhi Iyengar, Deputy Collector of Chingleput.

(*b*) Art industries should be encouraged, though common fabrics must be made in factories. Ancient treatises known to exist on agriculture, architecture, sculpture, &c., should be rescued from destruction and oblivion, and their lessons taught in technical institutes. Technical education generally should be encouraged by pecuniary grants, &c., and joint-stock companies for manufacturing purposes should be encouraged.

M.R.Ry. Narainaswami Nainar, Gingee.

(*b*) Village artisans should be instructed so as to repair improved implements.

M.R.Ry. K. Veeriah Vandiar Pundi, Tanjore.

(*b*) Industries should be developed by industrial schools.

M.R.Ry. D. Subbramania Pillai, Ilangi, Tenkási.

General.—No benefit has yet been derived from the Agricultural Department, whether in seeds, cattle, implements, cattle breeding. The stock farm has had no effect.

The College should be under the Agricultural Department, which should be administered by the Board of Revenue, and should deal only with agriculture.

E. Turner, Esq., Collector of Madura.

General.—Considers the committee are travelling far beyond the wants and conditions of the country as at present circumstanced. The main things required at present are briefly—improve your roads, dig wells, encourage railways, mend your tanks and channels; do not introduce expensive hobbies, and leave the rest to time and education.

M.R.Ry. M. Tillanayagam Pillai, Deputy Collector of Madura.

(*b*) Rural industries may be fostered by educating the village artisans.

M.R.Ry. M. R. Ramakrishna Aiyar, Tinnevelly.

(*b*) Considers that an improved hand spring, wheel and loom are much required; alludes to an improved loom introduced by the Calicut German Mission.

General.—Agricultural Department has, doubtless, done good in awakening interest among a section of the educated class; this cannot be gauged in a commercial stand-point, but it may be long before the ryots can reach substantial benefit. Want of results is due partly to the defective departmental methods; *e.g.*, the experiments in seeds were carried out without due selection of experimenters and without supervision; hence repeated failures and an increase in the ryots' prejudices. Different results would have followed the selection by the Collector himself of a few respectable landholders, careful personal explanation of the experiment and its expected advantages and occasional supervision by an expert. Moreover the seeds should preferably have been those of ordinary crops. Considers chemical analyses should be specially attended to at Saidápet. The Agricultural Department should devote itself entirely to agricultural matters, to ensure concentration of thought and energy.

M.R.Ry. V. Chappu Menon, Deputy Collector of Malabar.

(*a*) The fine brass works, the manufacture of grass mats and the weaving industry are all in a languishing state and require encouragement.

Mir Shujaat Ali Khan, Esq., Head Assistant Collector of South Canara.

(*c*) Government effort is called for to aid the introduction of new industries when a demand exists; *e.g.*, South Canara imports a vast quantity of cotton and silk cloths. Government might introduce practical weavers to teach the South Canara weavers, Native Christians, &c., the method of manufacture.

M.R.Ry. S. Sesha Ayangar, Nagercoil.

(*c*) Other industries are the establishment of oil-mills and the mining, but much money will be required (Travancore); similarly in Tinnevelly.

Rai Bahadur T. Rajaram Row, Deputy Collector, Madura.

(*a*) The other local industries are backward, such as the manufacture of cotton, sugar, &c.

(*b*) Government should develop them by granting loans at low interest to persons who are engaged in them.

General Remarks.—The chief necessaries of agriculture are (1) good soil, (2) extensive forests and jungles, (3) ample means of irrigation, (4) abundance of pasturage, (5) large number of cattle, (6) and sufficient labor. The ancient ryots possessed all the above advantages; but now, the soil has deteriorated, forests have been destroyed, wood is costly, irrigation precarious, pasture scanty, cattle weak, and wages high. Agriculture is not paying now as it did before; and hence dissatisfaction. Therefore the land-lords educate their sons for Government service. The matter of agricultural improvement must be taken up by Government, and cannot be left entirely in the hands of the ryots.

In the zemindaris, the "sharing system" works great hardship, and the irrigation works are neglected. Would compel zemindars to substitue a system of money-rent, and to set apart a portion of the annual revenue for the improvement of the irrigation works.

M.R.Ry. P. N. Subbramania Iyer, Dindigul.

General Remarks.—The Agricultural Department has not done *much* good to the ryots, nor is it likely to do as at present constituted. It has effected *no improvement of importance yet*, nor is it likely to effect, in seeds, implements, cattle and cultivation methods. It holds out *no inducements to ryots* to improve their stock and methods of agriculture. The influence of the Cattle Disease Department is insignificant. The stock depôt and its results are *little known*. Stock-breeding *may* be properly or economically carried on by Government, *but not to the same extent as by private agency*. The college *need not remain* under the Director of Public Instruction. The Agricultural Department *cannot* continue to be administered by the Revenue Board, and *should* be restricted to matters connected with agriculture.

M. R. Weld, Esq., District Judge, Ganjam.

General Remarks.—The assessment is unduly high in some districts, such as in Bellary, where land under a first-class tank or river channel is assessed at 12 to 18 rupees an acre; while it is unduly low in Tanjore, where such land is assessed at 6 rupees an acre.

M.R.Ry. Nataraja Pillai, South Arcot.

(*a*) Village industries, such as carpentry, smith, &c., are very backward.

(*b*) Industrial schools should be started to improve them.

APPENDIX F.

REPLIES TO THE MEMORANDUM FROM THE CHAIRMAN, AGRICULTURAL COMMITTEE, DATED 10TH NOVEMBER 1888.

MEMORANDUM.

The Government having intimated demi-officially that the services of Mr. F. A. Nicholson as Secretary to the Committee appointed by G.O., No. 686, dated 25th September 1888, to inquire into the constitution and operations of the Agricultural Department will not be available before the end of November or beginning of December, the President resolves to invite the several members of the Committee in the meantime to record such opinions or suggestions as they may wish to offer on the various points referred by Government for the Committee's consideration.

2. The reference, it is observed, embraces not only the Department of Agriculture as administered by the Board of Revenue, but also Agricultural Education which is controlled by the Director of Public Instruction. The President will be glad, therefore, to be favored with the remarks and opinions of the Director of Public Instruction on points 7 to 14, both inclusive. An office-note based on such information as may be available in the Board's office regarding the various points to be considered by the Committee will be drawn up by the Assistant Director of Agriculture, whose opinions on the various points included in the reference are also separately invited.

3. Points 2 to 6, both inclusive, will be referred to Mr. Dumergue, C.S., the Inspector of Cattle Diseases, Inspecting Veterinary Surgeon Shaw and Dr. Shortt for the favor of remarks.

4. These papers when received will be collated by Mr. Nicholson as Secretary in a Note, which it is suggested may form the basis of the Committee's discussions.

5. Opinions are especially requested as to whether such persons as may be willing to give evidence on any of the matters referred to the Committee should be invited to attend or do so.

6. Copies of the syllabus of the School of Agriculture at Saidápet and of its annual reports since 1882-83 and of the annual reports of the Department of Agriculture since the same year will be furnished to each member of the Committee.

(By Order of the Chairman.)

MADRAS, (Signed) P. RAJARATNA MUDALIAR,
10th November 1888. Secretary.

To J. Grose, Esq., M.A., C.S.
,, F. A. Nicholson, Esq., C.S.
,, Rajah Sir. T. Madhava Row, K.C.S.I.
,, the Honorable P. Chentsal Row, C.I.E.
,, John Adam, Esq.
,, Rai Bahadur A. Sabapathi Mudaliar Avergal.
,, W. Dumergue, Esq.
,, the Inspector of Cattle Diseases.
,, Inspecting Veterinary Surgeon Shaw.
,, Dr. Shortt.
Copy to the Director of Public Instruction.

REPLIES TO THE ABOVE MEMORANDUM.

BY W. DUMERGUE, Esq., C.S., SUB-COLLECTOR, SALEM, DATED 30TH NOVEMBER 1888, No. 1870.

Point 2.—From inquiries made I have been unable to ascertain that any improvement has been effected as to seeds. Various kinds have been distributed from time to time, but through want of instruction in the mode of sowing and subsequent treatment of the plant, there have been no satisfactory results in this part of this district.

With regard to implements, the Beheea sugar-cane mill is somewhat extensively used, but was introduced not by the agricultural but by local agents of the firms which supply the

mills. Some years ago, a Swedish plough was bought at one of the travelling shows, but has never been used. More recently lighter ploughs have been introduced by these shows and have been adopted by a few who can afford them.

As to breeds of cattle, no improvement has taken place in this division, which supplies bulls for other districts. The Aden bulls were a failure because they were unsuited to the large cattle bred here. An English bull which was brought to the stock from Madras was much admired and would have been greatly in request, but unfortunately it died. No attempt has been made here to improve the breed of sheep.

As to mares, judging from the foals which have been dropped to Government stallions, there has been a great improvement, and pony-breeding operation should, I think, be steadily persevered in. The people are now anxious to have their mares served by the Government stallions, but cannot protect their animals from the country tats, of which many hundreds still remain uncastrated. Until these are very considerably reduced in number, results cannot be satisfactory.

The methods of cultivation do not appear to me to have been in any way altered by the operations of the Agricultural Department. Whether the methods prevalent are susceptible of improvement is, I think, a question still to be decided and until it is decided any attempts at improvement are, in my opinion, hazardous experiments.

Point 3.—The only inducements which so far as I can see the department can hold out to ryots to improve their stock and mode of agriculture are those offered through the medium of agricultural exhibitions, but to render them effectual it is necessary to make the value of the prizes very considerably greater. A comparison of the amount provided for prizes at a horse show in Northern India with the amount sanctioned in this Presidency will be instructive.

Point 4.—In regard to cattle-disease, the operations of the department have been, according to my experience, very beneficial and deserve all encouragement; but the benefits can be secured only if a Stock Inspector is retained in the places where cattle-disease is prevalent until the outbreak is subdued. Flying visits are a waste of time, energy and money, and I have no hesitation in stating that the ravages of rinderpest in the Hosúr taluk this year would have been much more severe than they were had not the Collector directed the Stock Inspector to remain in the taluk for some weeks together. As an instance that the treatment of disease was appreciated, I may mention the fact that applications for the medicine used were received from neighbouring villages in Mysore territory. If, however, the system which I have indicated is to be pursued, it is obvious that a whole district is far too large a range for one Stock Inspector. I would recommend that at least every Revenue Division of a district should be provided with an inspector.

Point 5.—The stock farm has been in existence so short a time that it is impossible as yet to judge of the benefits which can be derived from it; but the term stock farm is, I submit, at present a misnomer. The establishment is only a depôt, where bulls bought from breeders in the forests are kept until they are fit to be drafted as sires to other districts and no breeding is carried on. If the farm operations are to be thus limited, then I think the institution of little value. It would be cheaper to buy bulls direct from the breeders or to keep a herd of cattle in the jungles. That the latter plan is feasible is shown by the fact that a fine herd of Amrut Mahal cattle belonging to Government throve and multiplied for some years in the Pennagaram forests and the charges incurred on account of them were only about Rs. 4 a month.

Point 6.—I doubt if the breeding of stock can be *economically* carried on by Government in the narrowest sense of the word; but, I think, it would be good economy in the end and a very proper undertaking for Government to import foreign breeds, to introduce crosses of indigenous and of foreign and indigenous cattle and sheep, and keeping steadily in view the different purposes for which different species are required effect a material improvement in the stock which forms so great a part of the wealth of the country.

By E. H. HAZELTON, Esq., V.S., A.V.D., Inspector of Cattle Diseases, dated 11th December 1888.

Paragraph 2.—Of the improvement effected by the Agricultural Department in the breeds of cattle and sheep in this Presidency I am unable to speak with much knowledge, for my experience of the Presidency before March 1888 was confined almost entirely to military stations, besides I have no means of comparing the condition of the stock met with before the department was started with the stock of the present day. I have, however, during the past nine months visited many parts of the Presidency and have seen the purely agricultural portions of several districts and one fact strikes me as being very significant, viz., that in many widely separated portions of the Presidency most of the working cattle present the main characteristics of the two breeds, viz., Nellore and Mysore. (In the term Mysore I include the Alambadi and Colar breeds which are found in Mysore and Salem). By this I mean that the superior cattle met with in different districts and which are usually seen at work on the roads and in the fields are crosses of the breeds mentioned with large indigenous cattle or are met with pure. If the Agricultural Department have had anything to do with the maintenance of these breeds of cattle, there can be no possible doubt of the benefit which has accrued. There is

room for improvement in the cattle of most districts and this is especially seen in the South and West Coast, where the animals are small, weak and practically useless for working purposes, to say nothing about their dairy properties.

With regard to sheep I think there is room for a very great improvement, looking at the question either from a wool-producing or mutton-producing point of view. There is no reason why the best of sheep should not be bred in many parts of the Presidency, but there are very few sheep worth the name to be found at present.

Horses are not bred in this Presidency, at least I have never met with any colts other than ponies. Ponies are not largely bred and it is very difficult to come across any other pony than the mis-shapen country "tat." Ponies of thirteen hands two inches high with good looks I have not yet seen in the districts.

The colts and fillies at the Salem Agricultural Exhibition were many of them the produce of Government sires and I think that the pony-breeding operations will eventually prove a great success. The improvement in the class of pony will be very great. Given a few years, a number of pony mares, the produce of Government sires, will be running in the districts, which, if they are not sold and are allowed to breed, will have more effect in improving the class of pony than years of advice to the ryots.

The feeling of the ryot towards any change of idea, any innovation, is one of repugnance and he would much prefer to be left alone to follow his customary procedure. Show him, however, what can be done and I think he will follow the lead. There is a proverb current in the Kurnool district which says "so long as the cow calves in our herd, what matter which bull it was." I think this sums up the question. Ryots do not care what the bull is and to go farther are not particular about the cow; the same applies to sheep and ponies, so long as the herd or flock increases, it is all right. The result may be seen in any village herd in which are seen all sorts and sizes of animals. There is no care taken to mate animals so as to secure the good points of each in the progeny. I have seen some magnificent cattle of the Nellore, Mysore and Alambadi breeds and these breeds are taken care of, and the fact of these splendid animals being reared in the country shows it is perfectly possible to breed good cattle. Any assistance rendered to the ryot for the improvement of live-stock must be of incalculable benefit as cattle constitute the wealth of the agriculturist of this Presidency.

Paragraph 3.—The great inducement held out to the ryot and which he does not as yet appreciate is "future excellence and profit;" but he does not look at it in this light. He is content to continue the practices of his forefathers and holds tenaciously to "custom." He does not look ahead. Whether the periodical exhibitions, fairs, &c., held in various parts of the Presidency are any inducement to the average ryot to improve his cattle, &c., I am not sure, but I think that very few trouble themselves about them; again in the remote parts of a district these things are unknown. In time I have no doubt, when these things become generally known, there will be seen a very great improvement and I am of opinion that the agricultural exhibitions, such as were held at Salem in March last, should be extended to every district. Once establish a competition or rather an interest in them and surely a keenness will be shown and pride will be felt by successful exhibitors which will continue. I am not in a position to remark on the inducements held out to the ryots to improve their methods of agriculture except indirectly through their live-stock.

Paragraph 4.—The operations of the Agricultural Department in regard to cattle-disease and its prevention are practically confined to—

(*a*) Giving advice to ryots to adopt certain sanitary measures for the purpose of diminishing or eradicating contagious and infectious diseases affecting their live-stock.

(*b*) Treating diseased cattle, principally those suffering from epizootic diseases, and supplying medicines, &c., *gratis*.

(*c*) Endeavouring to instruct cattle-owners in their mode of procedure should a contagious disease attack their animals.

In the first place I will sketch the work of the Stock Inspectors, presuming that his previous education and training and the strength of the establishment is before the Committee.

The Stock Inspector of a district receives a report through the taluk officials that a certain number of cattle of a certain village are suffering from a disease, so many are attacked, so many died and so many remain sick. He probably receives the report four or five days after the date on which the report was made by the village officer. He proceeds as soon as his duties will allow to the affected village and makes inquiries.

He finds a number of cattle scattered over the village, some in the ryots' houses, some wandering through the village streets, suffering from rinderpest (cattle plague) in its various stages. He probably makes a "house-to-house" inspection and finds many that are sick which are unknown to the village officials. Generally the sick cattle are tied next to animals as yet unaffected, feeding from the same place, &c.

He proceeds to tell each owner the nature of the disease (it would be well to remark that most of the ryots know this disease when it appears only too well) and offers to treat their sick; in very many cases he does so and administers medicine, does what he can to disinfect the sheds or house, and recommends that the sick be removed from the healthy or *vice versâ*. It is at this stage that the objections arise; they (the owners) immediately say "it is impossible; we have no other place to put our animals, we don't have them taken out of our house; we would sooner look after them ourselves; we treat our cattle as our children and will

not take them away from our house," and many other objections; (it must be remembered that every animal affected with rinderpest is capable of infecting any number of others, being in itself a centre of contagion); so segregation is not effected and enormous loss ensues.

In other cases the Inspector is afforded every assistance, gets the sick segregated, treats them, leaves a supply of medicines with the owner with plain, simple directions as to management, &c., but directly his back is turned (for he has dozens of other places to visit), the old order of things returns, the cattle are taken back to their owner's house, sanitation is neglected, the medicines are not administered, and so the plague continues.

Perhaps the Stock Inspector has treated some animals and has to leave for another village; the medicines he left with the owner are not persevered with and the animal dies; then the cry is heard that the Government medicines are no good.

I am glad to say that there are numerous instances in which the advice of the Stock Inspectors is carried out, and in nearly all the districts ryots freely ask for help and medicines, also the Stock Inspectors are well-known to the ryots in many districts and their efforts are appreciated. Much of the time of the Stock Inspector is taken up in travelling from village to village, from taluk to taluk, for there are not enough men in the department to supply one man to each district.

A district is an immense charge for one man with a contagious disease raging among the cattle of two or three or all the taluks. It is impossible to exaggerate the ravages of rinderpest among the cattle of this Presidency. I have seen villages in which the utmost distress prevailed owing to the enormous loss caused to the ryot by this disease alone and in nearly every district where this disease prevails one hears rumours of scarcity or famine.

The Stock Inspector cannot remain more than a day or two at each village, for he has very many to visit. Rinderpest does not confine its ravages to one or two villages, but spreads like wildfire along lines of communication between villages, over a taluk, over a district.

Besides treating sick cattle, the Stock Inspector does what he can to instruct the ryots in the elementary principles of stock-breeding, but I do not think they make much impression; stock-breeding will not receive the attention due to it until the ryot sees the result of the advocated principles and has it placed before him.

There are many very serious contagious and infectious diseases affecting live-stock besides rinderpest, but I have taken that as an illustration, for it is the one which one meets most frequently and which causes most loss. I think that it is a hopeless task to try and instruct the ryots so as to enable them to treat their own cattle; it is not the object that should be held in view. We should be able to do it ourselves, to grapple with and cut short these serious outbreaks, which are at present much too frequent and widely-spread, and to enable us to do it we must have more men.

The Stock Inspector should have a special training in veterinary subjects and he should be a man with a liking for his patients. His qualifications must be such as to inspire confidence in the minds of the ryots and gain their hearty co-operation. These are the men required at the present time and until the ryot goes hand in hand with the Stock Inspector and puts his shoulder to the wheel as well, it is, to say the least, a very disheartening task that is set to this department to accomplish.

I do not mean to infer that the Stock Inspectors of this department do not do good work, far from it; they are as a rule hardworking men, who try their best, but their lives are very hard and the task set them is too big; they must recognise the difficulty of the undertaking and consequently become disheartened by the many obstacles they meet with. This, I submit, is not to be wondered at, for when it is considered that they are left in a district with no one to advise or help them, subjected to hardships of all sorts and conditions and constantly on tour, it needs a man of great energy and one who feels an interest in his work not to become careless and idle.

All the Stock Inspectors have had a large experience of the prevailing diseases of cattle in this Presidency and their prevention and treatment and they could do a lot of good if their work was confined to a reasonable area; as it is I think that they, as a body, have done well and if augmented in numbers there will be a visible benefit in time, but at present the benefit which has resulted from the labors of this department is exceedingly difficult to be satisfactorily demonstrated.

I see it frequently and can name places where the ryots themselves acknowledge the value of the services rendered. In villages around Hosúr, in the Salem district, where a Stock Inspector was working for some months, the ryots take our medicine and advice gladly. On the Nílgiris should an outbreak occur, I think it would be cut short by the cattle-owners themselves who would follow the advice and instructions given them during this year. In Anantapur also I feel confident that in many parts the ryots would co-operate freely with us and no doubt the same applies to all the places where our men have had a chance of getting the confidence of the cattle-owners.

I am sorry to say that I firmly believe that very few young men (natives) even after their training as agriculturists enter this department from sheer liking of the professional work. This remark is very applicable to the present Stock Inspectors.

The Act for the Prevention of Cattle Diseases could be worked with a sufficient staff, but with the means at the disposal of the department it is next to impossible to do any good with it. I am of opinion that this branch of the department has done a lot of good during the comparatively short time it has been working. Under the most adverse circumstances, it has had to deal with a most bigotted people wedded to the custom of centuries, and yet if you go to a

village and ask the proper course to pursue on the event of an outbreak of, say, rinderpest, the more intelligent ryots will tell you, segregate.

The department has worked with the knowledge that the task was too big for them and I think, considering all things, it has worked hard and well.

Paragraph 5.—I cannot say anything about the stock farm as I have only seen it twice and have no special acquaintance with its working, but I think it should be something more than a mere depôt; it is situated in a charming spot with a capital climate and stock-breeding should be carried on there under very favorable circumstances.

Paragraph 6.—As regards the breeding of stock carried on by Government, I believe it is the only way to show the ryots the real benefits resultant from judicious crossing and careful rearing. I should like to see a stock farm in every district that could support one. These farms should eventually become almost self-supporting, for by periodical sales of young stock a considerable income might be realized and the initial cost be the only large outlay. They would do more to improve the indigenous cattle of a district than anything else, for by distributing bulls suited to the climate and soil and by actually placing good animals immediately before the eyes of the ryots, they would bring the value of the principles which lie at the root of all successful breeding operations to his understanding and he surely would begin to think that there was still something to be learned, and if it could be fully demonstrated to them that it is quite as important to study the dam-rearing and management of the young animal, as the sire, the benefit would be immense.

By F. G. SHAW, Esq., M.R. C.V.S., Inspecting Veterinary Surgeon, Madras Army, dated Bellary, 5th December 1888.

Points 2 to 6 in His Excellency the Governor's Minute is referred to me for expression of opinion.

Query 2.—The first part of this question relating to seeds, implements, &c., I pass over; that referring to cattle, sheep, and horses I remark on as follows:—

Cattle.—The only radical improvement under this heading which has come under my notice during a 32 years' residence in Southern India is in one particular breed, or perhaps it would be more correct to say the formation of a typical breed out of the indigenous stock of the country, the result of careful selection under European management. I refer to the *Amrut Mahal* cattle of Mysore.

The history of this once famous breed is too well known for me to enter into here. Full particulars from start to finish can be obtained from the archives of the Commissary-General's office, under whose department it was so successfully managed for many years; in fact until it was broken up by order of the Government of India in one of its hastily advised fits of economy without reference to this Government or to those who could have shown good reasons for its retention.

The Finance Commission (I think the earliest we had in India after assumption of the country by the Crown), composed of officers of another province, condemned the *Amrut Mahal* cattle-farm and the Remount depôt at Hosúr.

The former.—After sale of the entire stock at an enormous sacrifice of money and dispersion throughout India was within 12 months re-established, but, alas! its choice bulls and matured cows—the outcome of nearly 40 years' labor—were lost, never to be recovered.

This once famous breed is now professedly worked under amateur management by the Government of Mysore, but the animals now drafted into the Military and Commissariat Departments of this Army bear poor resemblance in bulk and power to those bred by Colonel Cadell, who devoted a lifetime in perfecting this once famous breed.

The latter.—The Remount depôt at Hosúr was also doomed by the Finance Commission for abolition, but the strenuous opposition raised by this Government tided over matters. In the meantime the Government of India seeing the necessity for similar institution in Bengal, framed theirs on the lines of that at Hosúr, which, fortunately for the State, was suffered to remain.

The question as I understand it (improvements in cattle, sheep, and horses) is a wide one. We are dealing with a large country, with varied rainfall, climate, grazing capacities, and agricultural requirements. What has hitherto been done to improve cattle and sheep is practically nothing.

The Saidápet farm was established with good intention enough, but Saidápet is not the Presidency as a whole, and what may have been desirable or suitable for that part would not suit the more arid condition of Bellary, Kurnool, &c. Moreover some parts are pastural, others agricultural. Large heavy carcased animals suitable to one district would starve in another. What I wish to impress is, we cannot lay down any hard and fast rules or create a homogeneous breed for the whole of this Presidency.

The lines I would recommend to start upon would be to *improve local breeds.*

Nature has more or less adapted the animal to the soil. Any one who has travelled through Southern India cannot fail to have noticed the difference in the shape, size, bulk and other local characteristics of rural cattle. If it should be decided to work on the lines I recommend it will be necessary to establish district *farms.* The details of working these farms, I need not touch on.

I might, however, say that great care should in the first instance be exercised in selecting the parent stock. The administrative control of these farms should be in the hands of an expert. Such expert could be procured in England. His pay should be good. His engagement for a long term of years with a prospective pension to look forward to. His duties would be to advise and select the fittest animals from which to breed or graft upon, but the cares and responsibilities of executive work should not be imposed on him. In other words, he should, as a specialist, have only his special duties to perform. He could be subordinate to the Revenue Board, or Department of Agriculture, but the fewer officials he has to deal with, the more satisfactory, I feel sure, would be the result of his work.

In improving local breeds, there are two things to consider—improvement for agriculture and improvement for dairy purposes.

In light soils, heavy plough bullocks are not needed; power would be wasted at the expense of pace. I mean an active light pair of bullocks would plough more land than a heavier and slower pair would in a day. Heavy bullocks too would require more food to support a larger frame. So that to produce an animal capable of ploughing deep cotton soil and use him for light cereal crops would be power thrown away and increase cost of feeding.

The present rural dairy cow differs in no respect from the plough bullock in breed; it is a miserable brute as a milk-producer. Dairy produce, by which I mean the manufacture of ghee, could be made a handsome source of profit to the ryot. This universal and necessary article of diet is not keeping pace with requirement and a large quantity is yearly imported into the country, which, later on and as requirement increases, may lead to adulteration and serious consequences.

It could hardly be expected of the poor ryot to indulge in the luxury of feeding two classes of animals. It would, therefore, be necessary, while improving draught and plough animals, to keep in view their qualifications as dairy animals also.

The great mistakes hitherto made in undertakings of this kind in India have been due to amateur management. Military or civil officers without any technical training are thought good enough to organize and manage farms, stud farms, or in fact any industry under Government. They may possess, as in fact they do, all the necessary zeal, and with time they may have gained a certain amount of practical experience at the expense of serious mistakes. They are moreover being constantly moved on promotion, or from other causes, and their successors, fresh to the work, in good faith, undo what they may think was wrong. No better example of such fatal working can be found than that of the Government studs in Bengal. Each successive superintendent had his own ideas of how to breed an army horse. There was no stability or fixed plan of working. One fancied Arab sires, another English, a third Norfolk trotters, and so on. For the best part of a century we have been trying to breed army horses in India, but since the days of Moorcroft (I think was his name) the fixity or lines laid down by that expert have constantly been undergoing change.

Establish a breed and by careful selections *perfect it.* We have examples of this in our own country. What *has* been done *can again* be done. Avoid the rocks and shoals of change and *persevere in one groove.* Unhappily for him the ignorant ryot is difficult to convince that any improvement is for his good; he views any advancement in this direction with suspicion and passively opposes it. Innovations are his *bête noire.* He will have to be approached with caution, cajoled, and patted on the back; while on the other hand legislature must step in and deprive him of the power of frustrating the good aimed at by compelling him to castrate his male stock except those specially licensed by competent authority.

Inseparable from the question of improvement in cattle is that of agriculture. For the most part cattle are village bred, that is, a ryot or cultivator keeps cows in addition to bullocks for tilling his land. There are others again who have large droves in jungle districts. It would be little use to stock a ryot with choice cattle if he cannot feed them. It is the custom I believe in most districts of this Presidency to let the ryot take up a certain acreage of waste land proportionate to his holding. I would (where it is possible to do so) encourage the taking up of this low assessed land and compel him to cultivate it for *bonâ fide* fodder crops and put a fence round it. Part of this low assessed land should be set apart for growing firewood with the view to saving the manure which is universally burnt and lost to the soil. Radical change in the rearing of calves, such as succulent fodder, skim milk, and lots of liberty to roam about when of tender age would have to be taught. Starvation in youth is fatal.

I now pass on to *Sheep.* This animal is capable of being greatly improved. The indigenous sheep of this country is a leggy, light carcased animal, partaking more of the character of a goat than a sheep, not only in appearance, but in its hair-like wool and habits. Its meat is ill-flavored, coarse and rank.

In some districts the woolly sheep is to be found often mixed with herds of the indigenous sheep. To the best of my knowledge they do not mate, that is, breed together. I am inclined to believe that the woolly sheep is an imported animal, and am supported in this belief from having traced to the districts of Salem and Coimbatore the disbanded Merino flock from Hosúr. The Court of Directors of the Honorable East India Company sent many years ago a consignment of Merinos to Hosúr—the Remount Depôt. The depôt had branches of its stud at Kongal in the Mysore province and at Kangiam in the Coimbatore district where some were drafted. It would be interesting to trace their distribution. It is a fact, however, that Mysore, Salem, and Coimbatore produce not only the best mutton but are centres of

coarse woollen industries. The latter—manufacture of woollen cloths—was probably the object of the East India Company Directors? had in viewwhen they imported the Merino flock. The old records at the Remount Depôt might probably throw some light on this subject. I joined the Remount Depôt in 1860 and remember seeing the foundation of some old buildings that still existed at the rear of my house, which I was told was the old sheep farm.

The climate of India is well suited for sheep breeding, being dry, tolerably uniform in temperature, and no necessity for housing at night.

I think some of the módern improved breed of English sheep could be introduced with advantage. Preference might be given to those having butcher or meat qualities than to wool producing. In a warm country fleeces have a tendency to thin and become coarse. Wool industries are not sufficiently advanced to require the choicer staples.

Horses.—Horse breeding has been tried and failed. I refer the Committee to Colonel Thornbull's report on a proposed re-establishment of the Hosúr stud, of which committee I was a member. Branches of the Hosúr stud were at Kongal in the Mysore country and at Kangiam at Coimbatore. In parts of Salem, Coimbatore and Mysore are still to be found here and there to this day the remains or degenrate produce of some of the best imported blood from England, the Cape, and Arabia. These have dwarfed down to the village "*tattoo.*"

Pony breeding is a late attempt to improve ponies in Southern India. The industry is too young yet to warrant an opinion. I was a juror at the late agricultural show at Salem where I saw some produce of Government stallions. Owing to defective information regarding the rules and failure to produce foaling certificates, many foals were refused entry. Those that were exhibited showed *very great promise* and were well reported upon. Though not officially noticed and omitted in consequence of not producing foaling certificates, the produce, said to be that of Government stallions, gave every indication of truthfulness judging from the shape and other improved qualities, &c. I have the greatest hope in a future for pony breeding, but view with great alarm recent attempts to raise the standard. I write with a certain amount of knowledge of the subject. This industry might be extended to Kurnool where there are many good ponies.

Query 3.—The only inducement it can hold out is that which regulates all arts and industries. A good article secures a good price; a better an enhanced price; and the best the highest price. If, say, a country sheep weighing 35 to 40 lb. sells as butcher meat for one rupee, one of a larger breed, like a Worcester, weighing 80 to 100 lb., ought to be double or treble as valuable. The cost to produce is the same *a fortiori*; the Worcester sheep is double or treble more profitable to breed.

Query 4.—At present little or none. One Inspector of Cattle Diseases is insufficient for so vast an extent of country. His subordinate staff is inefficient and insufficient. Legislature is wanted to check the spread of disease. This department is one only in name and is a reproach to a civilized country. Better that things should be left to chance than go on as we are doing. I refrain from further remarks.

Query 5.—I presume this question refers to Saidápet farm. This institution was too local ever to have done much practical good. No doubt it proved that stock could be raised, crossed, and improved. In a financial point of view I believe it was a failure, but why seek for profit from a national institution especially in its early or infant state? It is *incumbent* on the Government of a country to foster industries of all kinds more especially agriculture and its allied branches. The wealth of a nation consists in its people and in their prosperity. The bulk of the population of this country is agricultural, the major part of the revenue is contributed by them, they are, in fact, the backbone of the nation whose amelioration calls aloud for State reform.

Query 6.—That breeding of stock can be carried on by Government to advantage under scientific management there can be no doubt. Its "economy" in working of course will depend on the management. The formation of district farms, worked as far as possible on native method, to which should be attached a stock breeding branch, ought to bear fruit.

India is a slow country, it is a country of ignorant prejudices. Custom or *mamul* is its curse which nothing but perseverence and precept will overcome. Returns or profits should not be looked for for many years to come. The services of bulls, rams, &c., should be free. Here and there, where large farmers can be trusted, some home-bred stock might be presented or lent under conditions. Ultimately yearly auction sales of young stock would prove remunerative. The upkeep of district farms by Government for many years would be necessary. Perhaps they should be permanent for the distribution of improved seeds, implements, and animals.

I observe that goats are not noticed under the "points of inquiry." In Southern India the goat takes a prominent position as a domestic animal. The native goat is, next to the village pig, the most neglected of domestic animal. The goat is naturally a hardy animal and will flourish under most conditions of climate and short commons. The village goat of Southern India is only kept for improving the soil and for the scanty supply of milk it gives. This animal might be improved or better wiped out all together and the Maltese goat introduced in its room. The goats of Malta are famed for their milk-yielding properties. They are large heavy carcased animals on very short legs, prolific breeders, and continue milking till nearly

the time of kidding. A good Maltese goat will give as much as 2½ to 3 bottles of milk at each evening and morning milking! How few native cows can equal this?

Having remarked on the points 2 to 6 by invitation, I trust I may not be thought officious if I comment on Nos. 9, 10 and 12; having already done so in a *quasi*-official capacity to the Director of Public Instruction, copies of my letter are appended and marked A and B.

As regards point 12, I am of opinion that the Saidápet College should remain under the control of the Director of Public Instruction. Why not? It is a purely educational establishment and could only, with advantage and economy, be administered by that department. By creating another aiming at the same end, what is gained? Speaking from a professional point of view, I do not agree with the Director, who says that "the present staff of the College of Agriculture is quite adequate to prepare students for the Preliminary Group Certificate in Veterinary Surgery and Medicine"— a test which he believes "is quite sufficient for men of the grade of Cattle Disease Assistant Inspectors.* A little learning is a dangerous thing," &c. The Cattle Inspector can best speak of the value of these men.

*P.M.G. No. 285 of 19th June 1888, Revenue.

I believe the Director has or is about to propose the employment of a qualified Veterinary Surgeon, Principal or teacher from home on a salary of from 400 to 500 rupees per month. I very much doubt if a good man can be got for that sum, the more so as I understand he would be expected to lecture in anatomy, physiology, pathology, materia medica, botany, chemistry—organic and inorganic—and *as many more* allied subjects. A professional man with these varied teaching qualifications would be worth from £1,000 to 1,500 a year at any of our colleges, but in no teaching school in Europe would he be expected to take up so many subjects, or, did he do so, he could not do justice to them.

Being away from my head-quarters and on tour of inspection, I am unable to dwell more minutely on what is to me a most interesting subject; but as I shall be in Madras for the best part of January and early part of February, I shall be glad to attend the Committee and answer any questions they may submit to me.

ENCLOSURE A.

From F. G. SHAW, Esq., Inspecting Veterinary Surgeon, Chairman in Section Veterinary Surgery and Medicine and Animal Physiology, to the Secretary to the Commissioner for Uncovenanted Civil Service Examinations, dated 5th July 1888, No. 724—88.

I have the honor to report that the Committee, of which I am Chairman, has completed its labors and beg to forward, herewith, the result of the examination in Animal Physiology and in Veterinary Surgery and Medicine held at Saidápet at the Agricultural College on the 20th, 25th and 29th June and on 2nd and 3rd July 1888.

2. The maximum marks fixed by the Committee for the written, and oral and practical examination in the first and second stages were 120 each. Taking into consideration all the circumstances, we are inclined to recommend that half marks, viz., 60, might pass those students who may have gained that number.

3. We have duly considered the asterisk at the foot of the syllabus No. 32, subject "Veterinary Surgery and Medicine," and with reference to paragraph 6, "castration;" there were only 8 passed creditably out of 25 students, 8 showed fair ability, 5 were indifferent and 4 bad. Under paragraph 4, "Minor accidents and lamenesses," 7 passed creditably, 10 showed fair knowledge, 4 were indifferent and 4 bad.

4. We enclose an analysis of marks awarded to each individual student for the information of the Director of Public Instruction, whose particular attention we would wish to draw to the superior theoretical knowledge possessed by the students over the practical. As an instance, we point to No. 24, who has gained the minimum of qualifying marks, *i.e.*, 30 in the theoretical and 30 in the practical sections; nevertheless he was utterly unable to perform the simple operation of castrating a sheep. No. 16 is another instance who gained only 3 over the qualifying number of marks, and he was also ignorant of castration. On the other hand, No. 64, an East Indian lad, gained 89 marks in Veterinary Surgery and Medicine and the same number in Animal Physiology. The greater number of these marks were acquired by this student in the practical sides of both subjects, and is due to the fact of his superior practical training. This lad, Joseph Borthwick, is the son of the Veterinary Hospital-keeper at the Saidápet College. His workmanlike manner in surgery, ready and confident replies to questions in medicine, quick recognition of drugs, their uses, doses, &c., contrasted most favorably with the other students on the practical side, whose utter failure, nervousness and want of confidence in themselves, we feel it our duty to point out. This defect is due to one of two causes, probably both, viz., imperfect teaching or not sufficient time allowed for practical training. Be it as it may, I have no hesitation in saying (for my part) that 90 per cent. of the students who will have passed will never earn their bread as practitioners, and the question arises *qui bono*. After leaving the College these young men will never be in a position to acquire practical experience. There are no practising Veterinary Surgeons in this country to whom they could go to for a year or more, giving their services gratuitously in return for acquiring a practical knowledge of their profession, such as done in England. Their theoretical knowledge will more or less be

forgotten; and beyond having got a certificate or diploma, they will be useless to the public, in fact, dangerous.

5. If it is the intention of Government to continue to educate this class of student, we seriously wish to impress on the Director of Public Instruction the desirability of increasing the means of their attaining a more extended practical knowledge.

6. Many of the students were wanting in educational capacity. The autography in several instances was atrocious. Caligraphy not readable, and there was a want of ability to give expression to their ideas. This was not the case with all the students, but we noticed where the education was weakest, the marks were least.

ENCLOSURE B.

From F. G. SHAW, Esq., Inspecting Veterinary Surgeon, Chairman in Section Veterinary Surgery and Medicine and Animal Physiology, to the Director of Public Instruction, dated Ootacamund, 18th August 1888, No. 805-88.

The delay in replying your No. O-440 of 25th July arose from having to confer with my colleagues on the subject under reference. Their replies are now before me. Mr. Hazelton's I send in original * Mr. Symonds agrees with Mr. Hazelton; his letter is a private one touching on other matters, but I shall quote from it.

* To be returned.

My own views are, with respect to your first question, generally in concurrence with Mr. Hazelton. The tests are, I consider, too confined and rudimentary to be of any practical value to the veterinary students if they are expected to extend their studies to a proper test-requirement of a certificate of efficiency. The syllabus should be extended and the teaching in medicine and surgery should be far in advance of that now imparted to the students.

(a) In what respect is the Preliminary Examination in Veterinary Surgery and Medicine defective, and how these defects should be supplied as regards the theoretical subjects as well as the practical.

As regards the agricultural students, it is perhaps sufficient, in so far as it may be considered to them, as collateral and not an indispensible study. The defects can only be remedied by—

(a) An increased or higher educational test on this subject (see my letter to the Secretary to the Commissioner for Uncovenanted Civil Service Examinations, No. 724 of 5th July 1888).

(b) Special training and more time devoted to veterinary matters. A higher class education in Anatomy, Physiology and allied subjects.

(c) Special practical training in the hospital by clinical lectures. Attendance at out-villages where disease exists attended by a properly qualified Veterinary Surgeon who would clinically demonstrate diseases to the students in their various stages.

(d) Extension of the hospital promises and practice at the College with the view to give all the practical training possible.

(e) Students to be placed regularly on duty by roster and to act as dressers (when not attending lectures).

(f) As high-caste natives (Brahmans) are more or less prejudiced and consider it undignified and defiling to handle sick or unclean animals, students of lower caste standing should be invited to enter this branch of study.

With respect to your second question, it may be taken as already answered. I may, however, say that as the medical care of cattle is of first importance, a preference should be given to the admission of domestic beasts (horned cattle, goats, sheep, &c.,) to the hospital, but no animal sent for treatment should be refused admission.

(b) In what respects the practical teaching at the Veterinary class is defective for the training of Stock Inspectors and how these defects may best be supplied.

Mr. Symonds remarks—

"I return you the correspondence anent the Agricultural College with a letter from Mr. Hazelton on the subject.

"I agree with Mr. Hazelton respecting the candidates for the Cattle Inspection Department. These students should have a separate and more comprehensive course of instruction. With regard to the agricultural students, I think the present lecturer, Mr. Narain Rau (after his year's training in Bombay), will be fully able to instruct the agricultural students in Animal Physiology, Anatomy, Pharmacy and General Hospital practice, and if Government gets an Army Veterinary Surgeon to give these students a course of instruction in Cattle Pathology and Surgery with weekly practical instruction in the Veterinary Hospital, and take them occasionally into villages near Saidápet for the purpose of showing them the contagious diseases in cattle and sheep, they will become good and useful agriculturists. There can be no difficulty with respect to the students seeing plenty of cattle diseases close to the College, as the Chingleput district is never free from infectious and contagious diseases. I think this system will meet the case, and

I feel convinced that if Mr. Grigg gives this system a trial for one year, he will be agreeably surprised at the result."

Mr. Symonds' remarks are very much to the point, but just at present no Army Veterinary Surgeon can be spared. If a qualified Veterinary Surgeon is to be appointed, he should be for educational duties only. Possibly an Army Veterinary Surgeon might be spared as a temporary measure, but the department is too short-handed to enable me to say that his tenure of office could be depended upon for any fixed time.

I do not know if it is your intention to advise Government to educate veterinary students to a standard or efficiency of practising Veterinary Surgeons; if this is the case, there can be no question about employing the best teachers it is possible to get. Even if their employment stop short at treating purely village agricultural animals, they will need as thorough education as they would for equine practice.

By JOHN SHORTT, Esq., M.D., Retired Deputy Surgeon-General, dated Yercaud, 22nd November 1888.

I have the honor, in reply thereto, to state that the improvement effected by the Agricultural Department in the distribution and exhibition of seeds, implements and the breed of cattle, sheep and horses, as well as the instruction given for the improvements of cultivation is small and the results not apparent, committed as it must be to many hands in various parts of the Presidency. The indifference in most instances of ryots and others who do not thoroughly understand nor see immediate results from experiments recommended to be carried out by them is a fact, as this is a work of time which can but progress slowly. No inducements are held out to the ryots and others to improve their stock beyond the supplies of seed or the loan of a bull, ram or the services of a stallion pony; these animals are expensive to keep, as in most instances they have to be stall-fed and their results is the work of time.

As regards cattle diseases, the European system of treatment interferes with native religious and superstitious practices generally, and they do not understand the danger resulting from infectious or contagious diseases and the object of isolation and segregation of diseased animals, the more so, as such practices cost time and money to carry out thoroughly.

As regards the stock farm, the benefits may not be apparent to any extent at first. This must be expected, as the improvement of stock is the work of a life-time and not to be accomplished in a day. The system resorted to by the Agricultural Department is a good one as regards the distribution of good sound seeds, well-bred bulls and rams and the keeping of such animals for public service at the late Saidápet Farm, the result of which, to a careful observer and one interested in the subject, can be seen in the young cattle about Madras during the last few years carrying a strain of English and Aden blood among them. This is a great improvement, but no great interest is maintained by the owners of such animals to keep up this improvement and carry it on further, for after a time they are sold perhaps and get lost among the crowd of country cattle. The breeding of stock and other agricultural experiments cannot be carried out economically, for experiments, whether carried out by Government or private individuals, must always prove expensive. This is a positive fact I can confirm from personal experience; it requires personal interest in this subject; at first the financial result must always prove small for a large number of years, and experiments to prove successful must be carried out on a large scale. The Agricultural Department is an expensive one, carried out as it is by Government and it cannot be otherwise, as a scientific staff has to be imported, but from their smallness their services do not generally become apparent. Their services are chiefly confined to the Presidency; to prove successful a qualified staff should occupy each of the districts of the Presidency; they must not only be qualified but hold a certain social position to command respect and be prepared to go among the ryots so as to mix and converse with them freely and win their confidence. It is then that the large body of ryots will fall in with their improved views and try to carry them into practice.

APPENDIX G.

Letter from W. R. ROBERTSON, Esq., M.R.A.C., Principal, Madras College of Agriculture, on furlough, to the Secretary to the Agricultural Committee, Madras, dated Scarborough, 27th November 1888.

Had I been in Madras at the present time I would, I presume, have had the honor of being called upon to give evidence on some points connected with the investigations of your Committee. I venture therefore to submit the following views and opinions, in the hope that they will receive full consideration :—

No. 1.—" What benefit has accrued, or is likely to accrue, to the cultivating classes from the Agricultural Department as at present constituted ?"

The Agricultural Department has existed as now constituted only since 1882. To this period only my remarks will apply. I hold the opinion most strongly that the Department is unlikely to confer any substantial advantage on the cultivating classes as long as it continues to be a branch of the Settlement Department, for as such it will never secure the confidence of the Agricultural classes. It was in my opinion a fatal error to combine two such Departments. The farming classes may be wrong in the estimation in which they hold the Settlement Department, but when it was notorious that the Department was a very unpopular one, it was certainly an unfortunate circumstance that the new departure, in the position taken by Government in regard to the farming interests of its tenants, should have been exposed to share in this unpopularity. Started as the new scheme was, without officers, or means, for undertaking any work really worthy of a State deriving its revenue almost entirely from Agriculture, it could depend for success only on the good-will and sympathy of the Landed classes and of those engaged in farming. Having been associated with the new Department, and having had a previous experience, extending over fifteen years, in connection with Government efforts to improve Native husbandry, I have enjoyed very exceptional opportunities of ascertaining to what extent the new departure secured the confidence and sympathies of those interested in South Indian farming. My experience proved most emphatically that the change, at first at any rate, resulted in the withdrawal of the sympathy and interest that in the years before had gradually sprung up, and was steadily increasing, in the work of Agricultural Reform instituted and aided by Government. The loss of touch between the Agricultural Officers of Government and the farming classes was exhibited in a very remarkable manner by the very sudden decrease in the number of letters I received from Natives and others seeking advice, or communicating matters of interest, relating to Agriculture. This correspondence, which numbered over 2,000 letters annually, suddenly fell to half the number, and gradually nearly ceased; while visits from, and friendly intercourse with, leading native agriculturists ended almost as abruptly. Whether my agricultural correspondents and friends showed a want of wisdom, or the reverse, in the course they took, is not the question before me. I state only the facts, but venture to add that the result was one that might have been anticipated. But were the Department really efficient and freed from all connection with the Settlement Department, it would yet be much too early to attempt to specify, and estimate the value of, any possible results. But the Department, so-called, has notoriously been without officers or means for carrying on any work worthy of a State Department of Agriculture, while the "Head," and I may add the policy, of the Department has been changed half a dozen times in the six years that have passed since the Department began work. Nor will it be possible to form an estimate as regards the future, unless the Department is freed from all objectionable associations, has its future policy properly formulated and prescribed, and the means are provided for carrying out the policy in an efficient manner.

No. 2.—" What improvement it has effected, or is likely to effect, in seeds, implements, breeds of cattle, sheep, and horses, and methods of cultivation throughout the Presidency ? "

There is no substantial difference between this and the first question, and my reply to the first may be taken generally as a reply to this. Had the question read " what improvement is a properly organized Department of Agriculture likely to effect in seeds, implements, breeds of cattle, &c ," I would have had much to say, for my twenty years' experience in connection with agricultural reform in South India has furnished many suggestions.

No. 3.—" What inducements does it hold out to ryots to improve their stock and mode of agriculture ? "

I am aware of no inducements that are held out to ryots to improve their stock, beyond the offer of a few prizes at Agricultural Shows; but only three or four of these Shows have been held since the Agricultural Department was constituted on the present footing; while the whole amount awarded in these prizes in the six years cannot have exceeded £700, a small sum, it must be admitted, for the improvement of a farm-stock numbering about nineteen millions!! Probably in the same period, a score of bulls and a couple of scores of rams of improved breeds have been distributed by Government for the improvement of indigenous stock. While at the Saidápet Farm, a few bulls and rams were always at the service

of stock-owners. As regards inducements to ryots to improve their mode of agriculture, I am not aware that the Agricultural Department has offered any inducements for this object. Some years ago I proposed that Prizes should be offered to induce cultivators to adopt a better system of farming their land, but the proposal was not approved. There have been two or three Ploughing Demonstration Parties at work in a few places, and some Ploughing Matches have been held to enable the people to see the kind of work that improved ploughs can do. The Saidápet Farm also afforded an opportunity to those interested of seeing improved methods of farming in actual practice, such as, the thorough tillage of the soil by inexpensive processes, by the employment of improved implements suited to the conditions under which ordinary farming is practised; the utilization of waste substances as manure that the ryot made no use of; the better culture of crops ordinarily grown, and the culture of new crops suited to South India; care in the selection of seed; care in the harvesting of crops and in preparing produce for market; the careful breeding; feeding and general treatment of farm-stock, &c. But the Saidápet farm has had no connection with the Agricultural Department for several years, while under the instructions of Government it has in later years been worked in the interests of the College of Agriculture, and not with the objects for which it was first instituted. Indirectly, however, the Saidápet Farm has undoubtedly had influence even in later years, in some instances considerable influence in inducing the adoption of better modes of farming; it affords a field for the practical training of the students of the College during the three years over which their training extends, and a number of these men have in their after experience turned to good account the practical information gathered at the Farm. Of these men, I would instance only C K. Subba Row, now Sub-Assistant Director of Agriculture for Madras; Krishna Iyer, Superintendent of the Government Farm at Nagpore; and Streenivassa Iyer, who did such excellent work in originating and carrying on the reforms in the management of the estate of the late Mr. Krishnsawmy Mudaliar at Shiyáli, in Tanjore.

No. 4.—"Its operations in regard to cattle disease and the benefits resulting from those operations."

There cannot, I think, be room for any doubt regarding the utility of the cattle-disease prevention operations carried on by the small band of men trained for this work; but they are far too few in numbers to have any marked effect. They are stationed widely apart over the Presidency, each with a charge over about one million head of farm-stock, scattered over a territory exceeding 6,000 square miles, have very unsatisfactory travelling allowances, and have to contend singly against the prejudices and suspicions of the farming class, who always receive with doubt any new efforts of Government made in their interest. As the men engaged in this work have all received an Agricultural training, I would prefer to see them employed in an agricultural, rather than in a veterinary, capacity, for I believe that if so employed they could do more good than they possibly can under present arrangements. The very serious loss of farm-stock in South India when epidemic diseases prevail must, I think, be attributed generally to the impoverished condition into which the stock too frequently get, and not to any unusual severity of the diseases that prevail. It is the educated Agriculturist, with, of course, a knowledge of veterinary matters, that is needed in all parts of the Presidency, rather than the Veterinarian.

No. 5.—"The operations in connection with and the benefits derived from the Stock-Farm administered by the Department, with financial results."

As it cannot yet be more than two years since this farm was opened, it is surely too early to attempt to specify and value "the benefits the farm has produced," or show "the financial results" of the experiment. Supposing that breeding operations commenced on the day the farm was opened, the farm herd cannot yet possess a single bull or cow bred at the farm sufficiently old to be used in breeding. As I have no personal knowledge of this farm, I forbear making any further remarks.

No. 6.—"Whether the breeding of stock can be properly or economically carried on by Government."

My reply is yes, to both questions, that is, under proper management and with suitable means. If, however, the latter question is to be understood as "can Government produce stock that can be sold at a profit in the markets at the low prices at which ordinary native stock are sold," I have no hesitation in stating that Government cannot do this, and that it would be highly undesirable that they should make the attempt. But if it is admitted that it is necessary that steps should be instituted to improve the farm-stock of the Presidency, and I believe that every one competent to form an opinion holds that it is absolutely necessary that such steps should be taken, I feel strongly that the work could be done efficiently and economically by Government, and that, in the present circumstances of the country, it is only through the agency of Government that any really beneficial work can be done in this direction.

No. 7.—"The duties of the officers employed under the department."

This is a matter that concerns the organization and objects of the Department, and until the latter are formulated and prescribed, it will be impossible to offer any observations likely to be of use. But assuming that it is in contemplation to reconstruct the department on an agricultural footing, on the lines originally laid down in the Proceedings of the Madras

Government, Revenue Department, dated 22nd September 1871, in which the objects were formulated as follows:—

(1) To ascertain by experiment the proper use of rotation in crops in this country;
(2) To introduce the system of root or green-crops in lieu of fallow, without irrigation.
(3) To introduce new crops;
(4) To provide new kinds of seed, and fresh seed for the crops now cultivated;
(5) To make experiments in the use of water for the cultivation of crops now termed "dry" crops, and for raising grasses and other crops to be used as fodder;
(6) To make experiments in the use of lime and other manures, mineral and animal;
(7) To introduce new and improved implements of rural labor;
(8) To improve the working cattle, sheep, horses, and other varieties of live-stock in the country;

which, with some slight modifications and some additions, would even now constitute an excellent programme of objects for a Department of Agriculture. I would venture to recommend the scheme that I submitted in a letter to the Board of Revenue, No. 620, dated 19th July 1877, and to which the Board, as then constituted, afforded their hearty approval, *vide* their Proceedings, No. 5223, 13th December 1877, paragraph 10—"The Board therefore resolve to recommend the adoption in its general features of the scheme now put forth by Mr. Robertson." Under this scheme, the Agricultural Department would be a purely agricultural institution, and its officers would be engaged in agricultural duties of a definite kind, calculated to have an immediate influence for good on the husbandry of the people; while the scheme, if worked by good men, could not fail to secure the sympathy and co-operation of the landed and farming classes. Such a scheme might be worked now almost entirely by Native agency, and therefore much less expensively than it could possibly have been worked at the time it received the approval of the Madras Board of Revenue, for amongst the graduates of the College of Agriculture there would be no difficulty whatever in meeting with a sufficient number of really suitable men.

No. 8.—"The best means of increasing the efficiency of the Department, having special reference to the benefit of the agricultural community."

As I have already stated, I consider that the Officers of Government employed in duties connected with the improvement of Native husbandry should be entirely disassociated from all connection with the assessment of Land Revenue. The department should be strictly agricultural, and the "Head" and the whole of its officers should be trained Agriculturists. If it is necessary that the Forest, Engineering, Medical, and other Departments should be officered only by men who have received a regular professional training, it is surely necessary that this should be insisted on as a qualification for employment in State duties in connection with the land, for important though are the interests entrusted to these Departments, this importance sinks into comparative insignificance when contrasted with the vast stake the State and the people have in the proper utilization of the land. Indeed, I would not only insist on all officers attached to the Agricultural Department, from the "Head" downwards, being trained men, but I consider that every officer of Government, who is employed in connection with the land in any way, should have some knowledge of agriculture. My difficulties, in carrying on the work entrusted to me by Government during the last twenty years, were enormously increased from the want of even an elementary knowledge of Agriculture on the part of those from whom I ought to have received sympathy and support. I have no hesitation whatever in stating that there is no measure amongst those of indirect action that would more largely contribute to the benefit of the agricultural community than would the introduction of a Rule demanding from all candidates for employment in connection with the Administration of State Land, a knowledge of, at the least, the Principles of Agriculture.

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The reasons which have influenced the Board may be briefly summarized as follows:—

(1) That unless systematic instruction in Agriculture and the Sciences bearing on it is given at the Saidápet Farm, competent Superintendents for the Experimental Farms which are to be instituted cannot be trained there;
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No. 10.—"The class of students at the College and the conditions under which they come to it."

The Calendar and my Annual Reports give full information on these points. The majority of the students are men selected and sent to the College by Collectors. Some of these men were subordinates in the Land Revenue Department, who had been granted leave of absence, without pay, during the period over which the course of instruction extended. As my Annual Reports show, at least three-fourths of the students are connected with landed families.

No. 11.—"Whether the students engage in agriculture after leaving the College."

Pages 114 to 124 of the Calendar show the occupations of the students, who had obtained the College Certificate up to the end of 1886, as far as information could be obtained. It will be noted that nearly the whole of the men who have obtained the College Certificate are engaged in work in which their training cannot fail in proving of great advantage to the country. But on this point, I have caused inquiries to be made in connection with another matter, and hope soon to send you more recent fact. It must, of course, be remembered that it is not yet 10 years since the first Certificated student passed out of the College. Men from Bengal, Bombay, the Punjab, the Central Provinces, the Nizam's Dominions, Ceylon, Burmah, joined the College and went through the full course, in most instances at their own cost. While the following Native States and Zemindaris sent students and paid all their expenses: Mysore, Travancore, Holkar, Patiala, Berar, Kattywar, Dewas, Goundal, Wadwhan, Ulwar, Kolhapur, Vizianagrum, Karvetnagar, Kalahasti and others. Though only about 200 Certificates have yet been granted, men holding these Certificates may now be found in nearly every Province and Native State in the Empire of India. Nearly the whole Staff of the College of Agriculture is composed of men who have graduated in the College. Nearly every Public Farm, Government and Native State, is now officered by "old" students. The recent very successful Agricultural Exhibition in Mysore owed much of its success to an "old" student, who held the office of Secretary. Another "old" student, Mr. C. K. Subba Row, Sub-Assistant Commissioner of Agriculture, Madras, conducted the executive duties of the Agricultural Department during the recent absence of the Assistant Commissioner in England. The Cattle-disease Prevention Department is composed entirely of men who have graduated in the College. A number of "old" students are doing good work in connection with forestry under Government and Native States. A number of them are employed in the Presidency and in several Native States as Land Revenue Inspectors, positions of considerable importance for the diffusion of Agricultural information; for these are the only officers of Government who are in close and daily contact with the cultivating classes. Several are managing large estates, either on behalf of others or on their own account.

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I would combine in one department the so-called Agricultural, the Forest, the Geological, the Horticultural, Meteorological, Horse-breeding. The whole to be placed under a Commissioner of Agriculture, having functions and responsibilities very similar to those pertaining to the office of Agricultural Commissioner in the United States of America.

(Signed) W. R. ROBERTSON.

Government, Revenue Department, dated 22nd September 1871, in which the objects were formulated as follows:—

(1) To ascertain by experiment the proper use of rotation in crops in this country;
(2) To introduce the system of root or green-crops in lieu of fallow, without irrigation.
(3) To introduce new crops;
(4) To provide new kinds of seed, and fresh seed for the crops now cultivated;
(5) To make experiments in the use of water for the cultivation of crops now termed "dry" crops, and for raising grasses and other crops to be used as fodder;
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(Signed) W. R. ROBERTSON.

APPENDIX H.

NOTE ON THE MATTERS BEFORE THE AGRICULTURAL COMMITTEE,

By C. BENSON, Esq., M.R.A.C., Assistant Director of Land Records and Agriculture.

My individual opinions have been asked for on the questions put in G.O., dated 25th September 1888, No. 686. The questions appear to relate to the work of the Agricultural Department since it was constituted in 1882. If, however, it is desired to go further back, a reply to the questions of the Famine Commission, prepared by me in 1879 under Mr. Robertson's orders, will be found to contain a great deal of information on the points alluded to; but I do not feel able to fully represent the case, as the work was conducted under the supervision of Mr. Robertson for almost the whole time previous to 1884. The Saidápet Farm records compiled by me contain a summary of the work done at Saidápet, as far as farming operations there are concerned, during its existence as an experimental farm, but not of course of other work done by what was in fact, though not in name, the Agricultural Department, in years prior to 1882.

2. *Question* (1).—As at present constituted and according to the orders of the Government, the object of the department is inquiry and record of existing practices rather than any attempt to bring benefits home to the cultivating classes That has been declared to be an entirely *secondary* object, and one, according to the orders of the Government of India, which must be deferred till the dim future. A history of recent years would, however, show that this policy has been in many directions wavered from in a small and tentative way.

3. I have always held the view that inquiry into existing practices should be the first object of the officers of the department; but, for nearly 5 years after I arrived in India, no opportunity of making myself acquainted with native practices was afforded me. Since then, and whilst still in positions which rarely allowed of my bringing my views to the notice of the higher powers, and only responsible for carrying out the particular work given to me, I have been able to study the practices pursued in the districts noted on the margin; all the tours made for the purpose having been made at my own suggestion. It was only in April 1884 that I was in any way made responsible for a special branch of the department and since then I have completed a study of the agriculture and agricultural conditions of Kurnool and begun one of the Cuddapah district. I have also been able to see something of the agricultural practices of the marginally-noted districts. The agriculture of Coimbatore was investigated by Mr. Robertson in 1876. But it may be broadly stated that, until recent years, no systematic study of existing practices was begun. This failure to make a necessary preliminary study has allowed of much being said and done, for which there should never have been a chance. At the present time, however, I submit that I probably have as good a general acquaintance with the agriculture of the Presidency as a whole as any European, at least, therein.

Trichinopoly	1879
Cuddapah	1879
Bellary	1880
Godávari and Kistna deltas	1883

South Arcot.	Coimbatore.
Tanjore.	Salem.
Madura.	Tinnevelly.

4. Inquiry of the description laid down by the Government of India can, however, never be complete in itself, nor suffice to allow of the benefits thereof being brought home to the cultivator. Experiment with new methods, &c., is the next step. Experiment set on foot with a full knowledge of existing practices, to determine how far methods, &c., which *primâ facie* appear to need improvement, can really be modified with advantage, and also experiment devised to determine the nature and character of our farm crops, &c. Experimental investigation is, I take it, the true rôle of an Agricultural Department, and the only one which can justify its existence, as it is only on a basis of ascertained facts that true improvement can proceed. This extends over the whole field of agriculture, applying both to arable and to stock farming; but in many ways, we already know enough to allow of action proceeding, instead of our sitting still and waiting for light.

5. Thus I consider that the Agricultural Department, as at present constituted, is one only very little more so than in name. It does not fulfil its true rôle. In the past the great error, in not first investigating native practices, was made; much has of late been done in that respect; but, in the future, investigations should be carried on on other lines of wider scope. For the most part, until such investigation has gone further than it has at present, the department, however constituted, will not be able to greatly benefit the rural community. In these matters, we should follow the example of other great agricultural countries, *e.g.*, America, Germany,

Italy and France, remembering that in them investigation is far ahead of what has been done in India. England even, where almost everything is left to private enterprise and where the State is not directly interested in the land, is waking up to the necessity for giving State-aid to the agricultural community. In this Presidency, the State is interested to the amount of about Rs. 4,50,00,000 revenue from the land annually; the people are practically entirely agricultural; and on agriculture the country depends. The expenditure of a fractional percentage of the land revenue on investigation, properly devised, should, and there is every hope, if we look at the facts recorded in other countries, would benefit the rural community greatly. "In this Presidency the Government are in fact very much in the position of landlords and reaping the benefits of the position, cannot ignore its obligations," * as the Government have more than once admitted.

* G.O., dated 28th March 1865, No. 680.

NOTE.—The gross annual produce of the land, excluding stock, has been estimated at Rs. 50,00,00,000 and the live-stock of the country are worth probably 20 crores, if not more, for reliable data as to their number are not forthcoming.

6. *Question* (2).—The Agricultural Department has only been really organised for about 4 years; it has suffered from many changes in direction; it has been for the most part restricted to inquiry of one sort; it is therefore too early by far to say whether any improvements have been effected by it. The work going on in the Agricultural branch may be said to be confined to the following:—

(*a*) Agricultural shows and exhibitions of implements.
(*b*) Stock-breeding—cattle and sheep.
(*c*) Pony-breeding.
(*d*) Tobacco-curing.

A few other miscellaneous subjects connected with agriculture have been taken up, but they are not of much individual importance.

(*a*) *Agricultural shows* were only begun two years ago. Their effect must be very very gradual. The people do not as yet understand them. No real spirit of competition has yet been evoked and, until it is, these shows will not be of much value. The scope † of the shows should be greatly restricted, as I have several times pointed out. The encouragement of better cultivation in the growth of superior crops should be worked out on a system of field competitions. The location of the shows should be more carefully studied, so as to fit them in with the habits and customs of the people; making use of the great fairs and festivals. Appreciable results in such an enormous country cannot be expected to flow from two or three shows held in one or two places annually. We need numbers of them, held all over the country persistently till a spirit of competition is evoked and the educational value of the shows is brought home to the masses. The few thousands who have attended our shows so far may have learnt a little, but they bear about as small a proportion to the agricultural community as the money spent on the shows does to the capital sunk in the agricultural industry of the country.

† See Board's Proceedings, dated 27th June 1887, No. 170.

Exhibitions of implements are a subsidiary sort of show much better calculated to open the eyes of the ryots, by bringing new ideas to their doors, and allowing them to judge for themselves the value of the things set before them. So far they appear to have been successful; but the firms concerned in the supply of the implements, &c., can best speak of the results of these and of the greater shows, as indicated by the greater demand for their productions and the spirit of inquiry evoked amongst the people.

(*b*) *Stock-breeding*—Cattle and sheep can scarcely yet be said to have been started. A policy was decided on in 1887, and given effect to on a very small scale during the year now past. Money was given on a very small scale; little could be attempted; less completed, owing to the want of adequate money and staff for the work. Something has, it is true, been done in the past in sheep-breeding, but practically nothing has yet been attempted in cattle-breeding. Operations have been entirely stopped at present. Nothing can be expected without a very considerable outlay nor till after the lapse of considerable time.

(*c*) *Pony-breeding* is new but is making some progress. It is, in my opinion, not nearly so justifiable, in the interests of the agricultural population, to spend money on this object as on the improvement of cattle and sheep. Ponies are luxuries and are being improved for military purposes. Cattle are the sole tilling power of the country, sheep the great flesh producers and also the source of wool supply. Whilst pony-breeding is comparatively liberally supported, and a special staff is provided for the operations, stock-breeding is allowed to languish.

(*d*) *Tobacco-curing* has only just been begun under an expert in the business. There is great hope for benefit resulting from the experiments, if he is successful.

7. *Question* (3).—The only inducements which the department can hold out to ryots to improve their stock are the prizes offered at the Agricultural shows, and practically none are held out towards the improvement of their mode of agriculture. No money, honors, titles, or rewards are at the disposal of the department to give such encouragement as might be offered, at a small cost, to native agriculturists and which would be effective.

8. *Question* (4).—The operations for the prevention of cattle-disease have been conceived on too grand a scale, impossibilities have been attempted, and the results, as far as can be determined, are infinitesimal, but it must be said that, until quite recently, there has been no officer in charge of the work who has been able to give his whole time to the direction and supervision of the staff appointed for the purpose of dealing with cattle-disease; the number of subordinates available for practical working has been far too small to allow of their being really effective, even if they were of the right class of men; and the areas to be dealt with are so great, whilst the habits and customs and beliefs of the people are so peculiar as to render the work most difficult also. A radical reorganization of the system, which will provide a larger body of more simply trained practical subordinates, and an arrangement which will provide for competent supervision and direction of their work in the field is, in my opinion, absolutely called for. Executive officers should not be burdened with the training of subordinates which might, by slight modifications, be carried out at the Agricultural College, and if they be properly selected they should be able to supervise whatever work may be going on for the improvement of live-stock—cattle, sheep and ponies as well as the special work of dealing with cattle-disease.

9. *Question* (5).—The stock farm or depôt has not been fully started yet; a beginning, under unfavorable circumstances, was made early this year, but naturally no results have been obtained. I have protested, as far as I was able, against the arrangements made in connection with the depôt, which I have never believed to be likely to lead to good results. It, and the operations connected with it require the attention of a special officer, who has made stock-breeding a study. Liberal grants of money and work on a much larger scale are also required, if any good is to be done.

10. *Question* (6).—Breeding of cattle by Government is, as a general practice, not at all advisable, except as a means of investigation whether any good can be done by crossing different breeds with a view to improvement. But the supply of good sires for the use of the public is a manifest duty of the Government, and must, in the course of time, breed good results if carried out on a sufficient scale. Time and money, given with no parsimonious hand, are required to allow of any results being seen. In the history of a breed of cattle, a life-time may be required to produce anything like complete results.

As regards sheep-breeding, it appears that good stud rams are likely to be bred by the Government only at present, and they should be on a large scale. Much on a small scale has already been done, but for this work to bear fruit and for the cost not to be unduly great, the scale must be extended greatly.

11. *Question* (7).—The duties of the officers of the department are matters of fact, and I need not state them. I have, on previous occasions,* indicated my opinions as to the advisability of reorganization. I think the two existing branches of the department should, be amalgamated, and the work distributed among such staff as can be provided more generally so as to allow of better results being obtained. The Presidency should be sub-divided into divisions, each placed under a trained officer of the department, who would have charge of all the agricultural work to be done in it.

* See papers read in G.O., No. 14, dated 10th January 1888.

At any rate, the responsibilities and duties of the technical and executive officers should be separated from any work more purely connected with the administration of the department; at least as long as it forms part of the Board of Revenue.

Here I may add that, by a proper organization of the existing staff of officers now engaged in work connected more or less directly with agricultural improvement, the Government have the means of constituting a really powerful department and one which, if well-supported by funds, might well become a power for good. The staff consists of two Agricultural officers, one Chemist who has also passed through an agricultural training, one Botanist, one Veterinary Surgeon. Working together as harmonious parts of one organization, these officers could obtain far better results than can ever be hoped for under the present arrangements, when their energies are not fully utilized or turned to the best advantage. In the future, the existing staff might, no doubt, be improved individually by the recruitment of officers with greater special acquirements for certain specific duties; but the officers to form the nucleus of a department exist, and it only remains to organize them into an harmonious whole. The Chemist, Botanist, and Veterinary Surgeon would be most beneficially utilized in education; the agricultural officers on the practical work lying ready to hand in all parts of the Presidency. If agricultural education, developed as shown below, were a function of the department, the three former officers would also be able to fulfil special duties of advisers in their special branches to the Agricultural Department, at the same time as they were engaged in training subordinates for its executive work, and that training could be guided by a full knowledge of the end in view. Such an organization of staff into one special department would also be cheaper than the appointment of special officers to the individual posts, as the members of it would have a prospect ahead of them, such as individuals recruited for special posts rarely have. I have not alluded to more than the superior executive staff of the department, because, I think, as I show below, that, for administrative purposes, it should be combined with other branches of the public service; nor have I alluded to the subordinate staff, which these officers would have to supervise, as the organization of them would depend entirely on that of the supervising staff.

12. *Question* (8).—The efficiency of the department, with a view to benefiting the agricultural community, can best be attained :—

(1) By separating its work entirely from that of the Revenue Settlement Department, in fact as well as in name. The connection is, in my opinion, most injurious.

(2) By entering on a system of investigation and inquiry, such as I have already indicated in addition to the investigation of native agricultural practices, &c., now proceeding, and after formulating a settled policy adhering to it and supporting it with liberal grants of money for a series of years. For the purpose of investigation the department requires the aid of an Agricultural Chemist. Such an officer already exists on the staff of the Agricultural College. Without such an officer the department is very feebly constituted.

(3) By closely associating the work of the department with that of the Forest Department, with which it should be most intimately connected.

(4) By bringing under the charge of one responsible head, all the agricultural work being carried on in the Presidency including Education, Botanical Surveys, Meteorology, &c.

(5) By providing in each taluk one Agricultural Inspector of the rank of a Revenue Inspector, who should have the supervision of all agricultural records and should act as a travelling Instructor, such as is commonly provided in Ireland and Germany, and as cattle-disease preventive officer for his taluk.

(6) By modifying the system of shows and exhibitions as indicated above, and by setting on foot a system of field competitions so as to arouse a spirit of competition amongst the ryots, and induce them to attempt to improve their systems of cultivation.

(7) By the provision of seed depôts whence the ryot could obtain seed of high quality as "a change of seed," and also have the seeds he purchased tested.

(8) By placing within the reach of the ryots the services of good stock sires free of cost; taking up one tract of country at a time systematically.

(9) By placing at the disposal of the department honors and rewards for bestowal on cultivators who may do anything towards the improvement of agriculture.

(10) By providing the Director of Agriculture with an Advisory Board—such as was suggested by me in letter No. 62,* dated 10th January 1885 (Director's Proceedings No. 631-A, dated 15th April 1885) and in my demi-official to Mr. Wilson, dated 19th March 1885—to assist him in devising methods for carrying out the policy and attaining the ends which may be set forth by Government, and by endeavouring to found agricultural societies in each district to aid and assist in the work.

* Enclosure A.

(11) By altering the system of preparing the famine analyses; which is at present the heaviest duty of the department and does not call for the services of an agricultural officer until it is nearly complete. The statistical and analytical work might well be carried out by a simpler agency, and when completed the whole might be reviewed by the light of a comparatively cursory local inspection by a specialist, with a view to make it complete in its agricultural details. This measure is necessary to give the special officers of the department time to devote to work of agricultural improvement.

(12) By remembering at all times that, if any good results are to be obtained at all, it will be necessary to grant funds with a liberal hand. Without this nothing can be done. Funds should be provided on a scale commensurate with the agricultural interests at stake.

13. *Questions* (9 *to* 12).—Not having much personal acquaintance with the work of the college at present, I would only point out that great improvements have quite recently been made in the course of study there; that the institution has only been definitely recognised for a short time; that time is required to see results; that the things most required there are a Veterinary class which will turn out fully-trained subordinates for dealing with cattle-disease, and a class for teaching Foresters their theoretical knowledge. The idea that it is of any material use to attempt to give the students of the Teachers' College, who will chiefly become masters in High and Middle schools a smattering—for that is all they can acquire during their short stay at Saidápet, and with only a brief course of instruction—of the theoretical side of agricultural education is, to my mind, one which stands self-condemned. It can be of but little use to the students and they will not generally be placed in positions to make use of the little they learn. Agriculture is, above all things, a practical art, and a limited theoretical knowledge of it will not equip a teacher. If Normal students are to be trained in agriculture at all, this should be attempted at the elementary Normal schools, somewhat on the lines indicated by Mr. Nicholson; for the students there go out to teach in the elementary rural schools.

The college should, I think, be placed under the Agricultural Department, as the one most likely to understand what is required for a practical education and might well be managed by a committee, as the Bombay Veterinary College is, of which the Director of Public Instruction might be a member. The suggested Board of Agriculture might, in fact, direct the

management of the college. The institution should be recognized as a special training school for officers intended for the Land Revenue Department, for the Forest Department, and for the Agricultural Department in both branches, as well as for supplying teachers for the special education of schoolmasters of elementary schools in the mofussil. Recognized as such, it would stand on its own feet and become a power for good. It must, however, be always remembered that a college education can never of itself turn out a practical farmer, any more than a similar course of study can turn out a practical Engineer.

14. *Question* (13).—It is, in my opinion, the one thing that militates greatly against the possible utility of an Agricultural Department that it should be mixed up in any way with a Revenue Department, revenue being here so much land rent, or with one concerned in settling such rents. Forestry and agriculture are two interests of sufficiently great importance to call for the administrative powers of one head, and could and should be combined. With these should also be combined all work connected with arts, industries and museums—in fact, all special, technical or scientific work not coming within the scope of public works. Agriculture, Industries, and Forests, in three separate branches, should be combined together. The work of the department would then include all technical and industrial education, as well as all operations for the development of agriculture, trade and industry.

15. What is wanted most of all and above all things is a declared policy, definitely laid down and adhered to, adequate grants of money to carry out the policy and abundance of time to allow of results being obtained. So far there has been no such action; questions have been taken up very much at haphazard; money has been grudgingly given; time for results, in the few cases where experiments have been attempted, has also been grudged. In 1871 a policy (Experimental Farms) was resolved on, but was never carried out; in 1875 another policy (Agricultural education) was adopted; has since been greatly modified, and for a long time was only carried out in a tentative manner; in 1879, another scheme (Model Farms) was broached, but never carried out; in 1881, another idea (Mofussil Agricultural classes) was favored, but has never been carried to fulfilment; in 1882, came the reorganization of the department, followed by an impeachment of all former action in 1883, leading up to a new declaration of policy in 1884, by which practically all work for agricultural improvement was to be dropped and energy devoted to inquiry. Since then there has been a great amount of discussion regarding the manner and scope of this inquiry, only fully decided on a year ago.

16. Thus the one thing that has been absent in the past—a distinct and definite policy clearly defined and broadly conceived—is the great want of the present, and, besides this, there is the necessity for carrying it out decidedly. The selection of a policy to be pursued is greatly simplified by the resolutions passed at the Calcutta Conference of 1883,—especially those regarding the necessity for experiment being proceeded with in each province, and the total abandonment of the idea of "Model" farms — as the policy then set forth is definite and distinct and has a certain aim in view. The latter resolution though peculiarly expressed—for "Model" and "Experimental" farms are totally different things—is one in which, as I understand the meaning, I entirely concur. The true rôle of an Agricultural Department is "experiment" and research, not an attempt to foist a "model" on the people. The results of experiments may be brought home to the people most satisfactorily by a wide-reaching system of education, and, until experiment has proceeded much further than it has now, all attempts at "model" farming will most probably end in fiasco. On this question I have nothing particular to add to what I wrote in 1879 on the subject.*

* Enclosure B.

17. Here I may add, almost in words used in 1880, that, if but small progress has been made hitherto in agricultural reform and improvement, it has been chiefly due to the policy—or the changeable policy—of the Government, for the officers of the department have not been allowed to attempt much; their advice has not been listened to; and for a long time they were not enabled to gain any knowledge of native practices. Their hands have been tied. Besides this, it must always be remembered that in all countries the progress of agricultural reform and the accumulation of agricultural data on which to base reform is excessively slow; and that the obstacles which prejudice, ignorance, apathy, custom and superstition always and everywhere present to it, are in India intensified. There is still doubtless much to be learnt regarding native farming, and this work needs to be prosecuted energetically, as all efforts for improvement must be based on a thorough knowledge of the conditions under which the ryot works and of his habits. Aside of this, the solution of the problem of the improvement of native husbandry may be said, in a great measure, to lie in attracting a greater amount of capital to the land, and in inducing the higher classes to embark in a pursuit till now too generally regarded as a fit employment for serfs. To induce attention to the honorable position of the agriculturist; to foster an interest in his pursuits; to countenance and encourage all private individuals who devote time and study to the pursuit; to afford all, who devote attention to husbandry, opportunities for acquiring a sound practical and theoretical knowledge of the art; to make the Land Revenue administration more generally guided by ideas as to agricultural benefit; and to scatter agricultural information broadcast over the country are objects which, if the Government will act vigorously to attain them, must bring forth good results Unless, however, the Government is disposed to act vigorously in the matter, little or no tangible results can be expected to follow from their efforts.

18. Finally, I may venture to say that questions regarding the directions in which the improvement of native agriculture is possible and should be prosecuted can only be answered by those who have a full acquaintance with the practice of the art, and a thorough appreciation of the difficulties which beset the ryot in practising it. Nor can it be said, without similar knowledge and especially without a practical and scientific knowledge of the art, what steps are necessary to determine such questions. Well-intentioned schemes and plausible schemes in numbers have been prepared without these desiderata and have too often ended in lamentable failure. No more striking instance of this is to be seen than in the case of the Saidápet Farm. Started in 1865 as a "Model" farm; modified in 1871 to a hybrid; altered in 1876, so as to be partially educational and finally, by gradual evolution, made completely educational in 1885: opened by chance, guided by change, never selected (in the proper sense), it never had a fixed object and has passed through a fitful career, and *now* is far from being well-suited to the ends in view. Its history has led up to this inquiry. Let us learn by experience, and hasten slowly before embarking on any model enterprises in the future, making sure of each step by full investigation before rushing ahead. What such investigation should be I have already indicated. I trust, moreover, that if there are any points in this memorandum which the committee desire to have elucidated, I may be examined thereon.

MADRAS, (Signed) C. BENSON, M.R.A.C.
11th December 1888.

ENCLOSURE A.

SUGGESTIONS AS TO A BOARD OF AGRICULTURE.

From C. BENSON, Esq., M.R.A.C., Agricultural Reporter to the Government of Madras, to W. WILSON, Esq., M.A., Director of Revenue Settlement and Agriculture, Madras, dated Saidápet, 10th January 1885, No. 62.

In drawing your attention to the draft Bill given at pages 1–5 of the accompanying Report of the Commissioner of Agriculture, Virginia, I have the honor to suggest, for consideration, whether it might not be advisable to form in this Presidency a Board of Agriculture to consult and advise on all the operations of Government for the improvement of agriculture.

2. By such a Board we should probably obtain valuable advice and assistance. We might be able then to get the people to co-operate with us, and it appears to me that the improvement of agriculture is a work in which local self-government should be most encouraged and most easily adopted, provided the members of the Board are carefully selected.

3. Such a Board might be a first step towards forming a strong and independent Agricultural Society with branches throughout the country.

Demi-official from C. BENSON, Esq., M.R.A.C., Agricultural Reporter to the Government of Madras, to W. WILSON, Esq., M.A., Director of Revenue Settlement and Agriculture, Madras, dated Saidápet, 19th March 1885.

I enclose sketch for a "Board of Agriculture" something after American State style.

2. The annual convention would bring in the representative element, and also form a body to enable us to get at the ideas of the people better than we now can. It might be made a useful means of diffusing information, and could be held in connection with the exhibition scheme, Government allowing travelling expenses to representatives.

3. Six members of the Board might form a quorum. The nominated members might be—

(1) Principal of, or Professor of Agriculture in the Agricultural College;
(2) Inspector of Cattle-diseases;
(3) Government Agricultural Chemist or Government Botanist (when appointed);
(4) Senior Conservator of Forests;
(5) Chief Engineer, Irrigation;
(6) Government Entomologist (when appointed);

besides the two *ex-officio* members.

4. By way of a beginning, Government might nominate the other six members; as follows:—

(1) Secretary, Agri-Horticultural Society.
(2) Sabapathy Mudaliyar.
(3) Krishnasawmy Mudaliyar.
(4) Vencatacharriar of Tripatúr.
(5) Chairman, Chamber of Commerce.
(6) Representative of Planters' Association, Nílgiris and Wynaad.

Such a Board might meet definitely, say in September (to discuss proposals), and March (for convention), besides other times as seemed advisable.

5. As a beginning, all our "District operations" might be handed over to it, as well as exhibitions.

MADRAS BOARD OF AGRICULTURE.

An Advisory Board, to which general questions of Agricultural interest should be submitted and which should have direction, as far as possible, of the Agricultural operations of Government.

President—Director—*ex-officio.*

Secretary and Treasurer—Agricultural Reporter—*ex-officio.*

Directors—

6 nominated by Government.

6 elected by annual Convention.

To meet as summoned by President.

An annual Convention to be held at such time and place as Board select, and to it—

All Local Fund Boards;

Agricultural Societies or Clubs and Associations;

Chambers of Commerce;

to send representatives and such persons as Board suggest to be invited to meet.

Business—To hear and discuss proposals of Board for ensuing year.

To read and discuss papers on Agricultural matters.

To bring to notice of Agricultural Department points affecting Agricultural interests of country.

PROCEEDINGS of the Director of Revenue Settlement and Agriculture, dated Madras, 15th April 1885, No. 631-A.

Read letter No. 62, dated 10th January, from the Agricultural Reporter to Government, suggesting the idea of formimg a Board of Agriculture in this Presidency to consult and advise on all operations designed for the improvement of Agriculture.

The Acting Director considers that the proposal made in the above, viz., that a Board of Agriculture should be formed in Madras, is premature.

There is ample practical work to be done on theoretical matters, and scientific discussions may therefore well stand over until the time when local self-government, which is at present starting upon its trial, has become an established fact.

(Signed) J. F. PRICE,
Ag. Dir. of Rev. Sett. and Agriculture.

To the Agricultural Reporter to Government.

ENCLOSURE B.

MODEL AND COMMERCIAL FARM.

PROCEEDINGS of the Board of Revenue, dated 19th September 1879, No. 2649.

Read the following letter from C. BENSON, Esq., M.R.A.C., Acting Superintendent, Government Farms, to C. A. GALTON, Esq., Acting Secretary to the Board of Revenue, dated Saidápet, 22nd July 1879, No. 885:—

With reference to paragraph 4 of G.O., No. 1346, dated 26th June 1879, I have the honor to report that, for reasons which I shall state below, I am unable to see any way to attain at present on the Saidápet Farm the purpose mentioned, viz., to show, by means of a Commercial Farm, the comparative profits obtained under, and the comparative capital required for, the native system of farming, and one improved by the adaptation of the scientific knowledge of the West to the circumstances with which we have to deal here. English farming cannot, of course, be introduced bodily into this country. I have also ventured to submit a few remarks on the value of "Model Farms," and the possibility of inaugurating them in this country at present; and have also made a suggestion which, if it meets with the approval of the Board, I shall be glad to develop in more detail.

2. The only land on the Saidápet Farm which could be set apart for the formation of a "Commercial" Farm is a piece of about 14 acres lying at the extreme north end of the estate

and forming part of the land set apart for grazing purposes in the stock-breeding experiment which is to go on as soon as the Commissariat slaughter-houses are removed. This land consists of fields Nos. 30, 31, 32, 34, 35 and 36 of the farm, and has an area—

	ACRES.
Irrigable from the Mylapore tank about	5
Unirrigated land about	8¾

The land is poor, and has been levelled and terraced and greatly improved during recent years, but the actual cost of the improvements effected on this portion of the farm cannot be determined; formerly the land was in the state referred to in the extract quoted in paragraph 2 of the Government Order under reply. On this land there is one well, but a poor one, as the water-supply from it is uncertain and small; it is not capable of watering 1 acre of ground. About 5 acres of the land are liable to be flooded from the river, so that there is great risk of any crop put down being destroyed; over the same or a rather larger area of the irrigable land there is great difficulty in obtaining adequate drainage. The land is bounded on the north by the Mount Road and the Saidápet Cutcherry compound, and is thus exposed to a great deal of trespass and petty pilfering; it is so far from the quarters of the officer in charge of the farm that his supervision could not be very complete; the supply of water from the Mylapore tank for irrigational purposes is uncertain and unreliable; the soil and conditions met with are not at all similar to those met with generally throughout the country; and the land if taken up for this purpose will lessen our power of carrying on the proposed stock-breeding experiment, for which already we have only a small area of land available. This land is therefore, I consider, not suited to the work proposed, and no other portion of the estate is nearly so suitable as this is.

3. It is, however, I venture to submit, a mistake to believe that our work can have passed the stage of experiment after so short a period as ten years, work confined to one place, under conditions of a peculiarly exceptional nature; whilst the officers engaged here have had exceedingly few opportunities of seeing anything of native farming, or of judging how its methods can be most advantageously modified under the conditions met with; whilst, added to these difficulties, there has been an "almost entire absence of reliable information regarding the rational performance of the tillage of the ground, of the culture of our common crops, or of the management of live-stock under the conditions with which we have to deal;" and at the same time Government officers have had few, if any, coadjutors working for the same object as themselves. All of these things have been great obstacles to the collection of reliable data on which to base conclusions of a definite nature.

4. I am therefore led to the conclusion that it is as yet greatly premature to venture to attempt to set before the native farmers a "Model Farm," that is, a farm the system and practice of which we definitely advise them to adopt. At the same time I would submit that there is little hope of the effects of the force of example influencing the present race of ryots; but that, as the Board remarked in their Proceedings, No. 2112, dated 31st July 1878, we can "expect much from the establishment of Educational and Experimental Farms in some of the districts," and that "the main effect to be looked for from such farms should not be the impressions made on the adult agriculturist by a few successful examples;" the agricultural community generally, in this Presidency at least, not being in a position to apply and profit by the lessons to be learnt from the operations of the Model and Experimental Farms to any appreciable extent, save by slow degrees.

5. On the Experimental Farm itself at present we are engaged in demonstrating a system of farming which we have found suited to our circumstances, as far as our experience goes; the adaptation of portions of this and their engraftment on to native practices must be the work of time, and be chiefly left to the natives themselves to carry out. We can and do constantly demonstrate in our reports the actual cost of growing particular crops under the system we are following up, and this is, I venture to submit, the best method of testing the advantage the system would be to the ryot, whilst it is admitted that under the systems we are carrying out there is a greater certainty of crop, and therefore greater benefit to the State.

6. From what I saw of various native farmers during my tour in the Trichinopoly district, I am inclined to believe that, in that district at least, they are not a race that will copy readily or inquire eagerly regarding any such undertaking as that proposed by the Board, whilst the ryots around here are for the most part non-resident, the land being in the hands of pauper sub-tenants, by whom it is hopeless to expect that such work would be appreciated. Whilst on the other hand, if a Commercial Farm were carried on here, and our accounts were published, they would not carry conviction to the minds of any of the more advanced native farmers up-country, for they would consider that the results had not been fairly obtained, if a profit were shown, whilst if no profit were shown they would not understand the reasons by which it could be explained. We may demonstrate the facts of such a farm as honestly as we can, but never, I fear, beyond cavil. The peculiar circumstances of a Government Farm, which require a large expenditure on "appearances," where all things are bought at a premium and sold at a discount, where it is impossible to obtain full labor from coolies, and many other things, all militate severely against its "commercial" success and on this point I

would refer the Board to the latter part of paragraph 149 of the report of this department for 1874-75.

7. As far as regards the necessity for showing a comparison of profits for the education of our students, such has not of late years been considered a necessity in countries where agricultural education has been carried on for many years. In England, in America, and in Germany at first it was considered necessary that a Model Farm should form a part of the adjuncts to an Agricultural College; but it has since been found that such is not the case, and one after another most of the chief Agricultural Colleges have given up their Model Farms and adhered simply to experimental culture as their legitimate work. The assimilation of portions of the example set before our students here must, I submit, be left greatly to themselves, and it is our great object to demonstrate to them those principles of agriculture which hold good under all conditions.

8. It is now a generally accepted belief, in countries where agriculture is progressing most rapidly, that "Model Farms" are of but little use as a means of effecting reform. In this country the time, I believe, has not yet come for the possibility of instituting a "Model Farm;" and there is also, I believe, still less to be hoped for from such an institution than in countries where the rural population is better educated, more appreciative, less prejudiced, and possessed of more capital.

9. Perhaps, however, something might be done if Government resolve to adopt the recommendation of Board's Proceedings, No. 5223, dated 13th December 1877, and the carrying out of the preliminary practical training of our students elsewhere than at Saidápet, as urged in my letter, No. 784, dated the 10th July 1879. If ordinary average land were started with, we could tell what the actual cost of such improvements, as were considered necessary, might be, and so be able to determine, which we cannot do on the Saidápet Farm, what the legitimate rent charge on the land should be. Under such circumstances, it might be possible to work small areas, say 10 acres each, on distinct systems, commencing with the ordinary native method and gradually ranging upwards to what, as far as our experience goes, appears to us to be the best. In contrasting the systems, the local experience of native landholders interested in the work should be made use of; but it would be absolutely necessary that to do so localities should be chosen where a comparatively spirited and inquiring race of cultivators are to be found. For such a work the neighbourhood of Saidápet is, I consider, decidedly unsuited.

10. Although the system of working the land is only a part of good agriculture, still, to demonstrate side by side different systems more or less applicable to the circumstances met with would be of the greatest educational value; but the officer entrusted with carrying out of such work would require peculiar qualifications and tact in availing himself of the advice of his native neighbours.

In Proceedings, dated 19th March 1879, No. 732, recorded with G.O., dated 26th June 1879, No. 1346, the Board suggested that on part of the Saidápet Farm practical illustration should be given of the superiority of scientific Western agriculture over Oriental agriculture. The Superintendent declines the test on general grounds, and states that similar attempts have been abandoned in England, America, and Germany. He would thus confine the work of his department to obtaining information through tours, to experimental agriculture, and to scientific instruction of native students.

2. The Superintendent adds certain special reasons for declining the test at Saidápet.

3. The Board have no alternative but to accept the position.

(A true Copy and Extract.)

(Signed) C. A. GALTON,
for Acting Sub-Secretary.

To the Superintendent, Government Farms.

Copy to the Secretary to Government, Revenue Department.

APPENDIX I.

SECOND NOTE OF POINTS ON WHICH EVIDENCE OR SUGGESTIONS CAN BE OFFERED TO THE AGRICULTURAL COMMITTEE,

By C. BENSON, Esq., M.R.A.C.

I would divide such suggestions as I can offer under the headings of—

I. General and fundamental requirements for the promotion of agriculture.
II. Agricultural reforms and improvements, as far as relates to practice, under two heads—
  X. Tillage and arable farming.
  XX. Stock farming and management.
III. The means of bringing improvements to the knowledge of the people.
IV. Encouragement of self-help—
  (*a*) Amongst landlords and farmers.
  (*b*) in Societies.
V. Departmental and administrative improvements.

As, however, it is impossible within any reasonable time to treat a tithe of the subjects referred to fully, I only submit a brief abstract of those questions to which I could allude, and request that I may be examined on such of them as the Committee may desire. As far as possible, the ground travelled over in my previous note has not been touched upon.

I. General and fundamental requirements.

These include land tenures and land improvements—

(*a*) *Land tenures* are probably barred from consideration by the Committee, but attention might be drawn to the following matters, consideration of which seems to be necessary, as they affect the rural economy of the country greatly :—

(1) Necessity for limitation of freedom to acquire and throw up land.
(2) Necessity for demanding guarantee of possession of means to cultivate land taken up, from applicants.
(3) Check should be imposed on taking up poorer soils for *arable* farming.
(4) Check should be imposed on great sub-division of land.
(5) Encouragement of homestead farms, and facilitating exchange of land, so as to form enclosable farms.
(6) Encouragement of formation of grazing farms by giving suitable land for grazing purposes only ; a process which will lead to improvement of the poorer lands, if enclosure be insisted on.

(*b*) *Land improvement*—

(1) Necessity for the attraction of capital to, requires stable tenure.
(2) Land reclamation from forest, swamp or saline.
(3) Warping, terracing, drainage, tree planting, fencing, small irrigation works, *e. g.*, channels, well sinking, all possible improvements.
(4) Scrutiny of large irrigation works from agricultural point of view, before commencing.
(5) Drainage to go hand-in-hand with irrigation, and required elsewhere as much.
(6) Need for experiment regarding drainage, especially sub-soil drainage.
(7) Well irrigation—not economically profitable, at hired labor; value of—to ryot. Encourage digging by remitting part of assessment for 30 years, and safe-guard improvement.
(8) Uncertainty attending well sinking and necessity for mapping out country—
  (*a*) as to subterraneous supply.
  (*b*) as to quality of supply.
  (*c*) as to suitability of soil for irrigation.

II. Agricultural reforms and improvements—Practice—

X. *Tillage and arable farming.*—In the present day there is too much corn raising and no fodder or green crops are grown, thus there is no rest to land, and this combined with the loss of power to relinquish land and to give it rest and other economic changes necessitate change.

(*a*) *Tillage*—

(1) Dry land systems—

Defects—Shallowness, delays; Expense of time and labor.

Ineffective implements, nature and use of those existing, need for improvement, and new ones. Difficulties in the way of change.

The plough—prices, uses, efficiency, draught, repairs.

Other implements, in use in parts, *e.g*, *pedda-madaka*, *goru* as grubber, &c.

(2) Wet land tillage—

Waste of time, loss of opportunity, shallow tilth, evils of puddling, reasons for puddling. Waste of water in preparation. Foulness of land. Great cost of operations.

(*b*) Manures and manuring—

(1) *Cattle manure*—

Small amount available applied to limited areas. Poor quality of supply; reasons for. Waste and loss under management followed. Evils of burning.

Improvement of quality and system of application. Opening for experiment and research.

(2) *Sheep folding*—

Ineffectively conducted in many cases. No food for sheep. Poverty of manure.

(3) *Other manures*—

Need for inquiry and experiment as to method of use, action and value of manures generally. Investigation of effect of—

(*a*) Mineral manures—lime, saltpetre, bones, &c., also artificials;

(*b*) Vegetable manures—Green crops, oil-cakes, &c.;

(*c*) Animal manures—refuse;

on our crops with a view to determine their value (manuring) and points alluded to above. Necessity for experiment.

(*c*) *Seeds and seed sowing*—

Selection at present practiced. Benefits of change of seed. Means of affecting of such.

Methods of sowing—Broad-casting, drilling, dibbling and machines used.

Improvement of native drill, and more extended use demanded.

Necessity for experiment on the above and on exotic plants, and on crops from one district to another.

Means of carrying out, either at depôts worked by Government or by societies.

(*d*) *After cultivation*—

Inefficiency and cost owing to broad-casting.

Want of hoeing, in depth and frequency—want of drying, hoeing and aërating wet land.

Inefficiency of implements and tools.

(*e*) *Irrigation*—

Bad system of use of natural supplies, *i.e.*, not caught high enough up the country.

Lavish use of water. Necessity for experiment.

Improvement of water lifts; scope.

(*f*) *Cropping*—

Scourging mature of cropping. Want of real rotation. Want of diversification on some sorts of land.

Evils and objects of mixed cropping.

Need of experiment on alternation.

(*g*) *Harvesting and preparation of crops for market*—

Late harvest of cereals—evils of; need of experiment regarding time for cutting crops.

Methods of reaping, cost and labor of.

Methods of threshing; improvement and need of cheaper systems.

Investigation of preparation of crops for the market, *e.g.*, sugar, indigo, cotton, tobacco, oil-seeds, and need of experimental research; improvement of machinery for.

Introduction of iron sugar-mills and history thereof.

XX. *Stock-farming and management.*—There are two distinct and separate functions mixed together in questions of the Committee; one cattle-breeding and management, and the other cattle-doctoring. The one is the function of the stock breeder, the other of the Veterinary Surgeon specially trained for that branch of the profession. A stock-breeder may undertake the work of the Veterinary Surgeon and be able to discharge the function, but the Veterinary Surgeon is seldom, if ever, likely to be a skilled stock-breeder. It therefore follows that the first

requirement in these matters is the assistance of an agriculturist, who is specially a stockman, and in the present state of matters in the Presidency, he should be able to do all that is necessary for the department in regard to stock in both health or disease. The following points may be alluded to in this section :—

(1) Evils of present systems—

Promiscuous breeding. Castration and mulling. Want of shelter. Starvation at times, repletion at others. Absence of sanitary precautions. Want of care of young and breeding stock.

Growth of fodder necessary ; experiments required.

Want of special grazing lands for cattle owners, where their stock protected from the common herd.

(2) Need of experiments on feeding.

(3) Use of salt ; effect of price.

(4) Stock-breeders—

Status. Inducements for breeding—

(*a*) at present ; (*b*) which might be added (see below.)

Their system—as shown by Lambadies in Kurnool.

(5) Improvement of cattle and sheep—

Value of, and necessity for—means of effecting.

Need of experiment as to crossing.

(6) *Improvement of ponies*—

Objects not purely agricultural. Unsatisfactory results so far. Great cost. Should not be a first charge on department.

(7) *Cattle disease*—

(*a*) Losses not really great on the whole ; what attributable to.

(*b*) How to combat ; evils of attempting to use legislation ; best to use persuasion and influence.

(*c*) If law brought into force—provision of staff to really work the law necessary ; otherwise useless to legislate.

Revenue staff might be made competent, or part of it, with salustries to work under them.

(*d*) Present staff—ineffective—almost useless—cannot do any good on compulsory system. Not recruited from the right class of community —Brahmins not the best suited ; should be Sudras and Muhammadans.

Only policy, persuasion and influence working through local authorities.

(*e*) One staff if properly trained could undertake all we can do at present for agriculture, including cattle disease prevention. With the means at, and likely to be at, disposal of department, no very great specialization of training should be aimed at, but the best possible general training of subordinates held in view.

(*f*) Staff should be entrusted to supervision of a specially selected stock officer which would be best, or other agricultural officer if that is not possible, with such assistants as are available in Mr. Shunker and will be in Naraïn Rao.

III. Means of bringing home a knowledge of possible improvements to the people—

In studying this problem, it must be remembered that the mass of the people are unable as yet to read.

History and experience tells us that, where the result does not follow cause quickly and the results have to be checked over long periods and under varied conditions, example is useless, or nearly so.

(*a*) The only means by which the masses can be reached is education, and for that purpose the *general education* given in our schools should be modified, as in "Readers," to be better adapted to lines of life of the ryot, and so as not to take the thoughts of the boys away from the land.

(1) To work this out a supply of qualified teachers is necessary and these teachers must be supplied with—

(*a*) Simple text-books for their guidance.

(*b*) Means for object lessons, not solely confined to existing practices, &c.

(*c*) Reading books constructed with a view to developing the knowledge of boys on rural matters.

(2) To train these teachers suitably, the Mofussil Normal schools must be supplied with—(*a*) A farm school ; (*b*) A competent teacher of agriculture.

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(3) It does not appear to be necessary to touch the High school training by adding agriculture to the courses, but in Middle schools, if they can in any way be associated with the "farm schools" referred to under (2), some time under the teacher might be devoted to learning the scientific principles underlying agricultural practice. Boys from Middle schools who desire to carry their special education further should join the "Farm schools" entirely.

(4) All the work so far referred to should be regarded as a function of the Educational Department.

(*b*) In order to afford a complete scientific training in agriculture for landlords, especially when they are wards of the Court, land managers and other employés on the land, Land Revenue and Settlement officers, special teachers for farm schools, &c., Forest subordinates, and Vetérinary officers, a high class institution must be maintained.

(1) Such a college needs a complete staff, which should also be available for conducting original research.

(2) The Agricultural College * exists and needs chiefly a Veterinary Surgeon to complete the staff.

(3) The control of such an institution should be in the Agricultural Department for several reasons.

(4) At present, agricultural education should be free and endowed by the great landlord of the country.

(5) It must never be forgotten that a college education in agriculture must always be incomplete, and in not recognising this the test for the agricultural diploma is incomplete.

(6) A necessity exists for a wider practical training or apprenticeship.

(*c*) Such a system of higher education would provide a supply of teachers for the farm schools, and also for itinerant instructors, who should travel about the country and endeavour to reach the adults of the agricultural class. These itinerant instructors should carry about improved implements and machines for exhibition and be also cattle disease officers, *i.e.*, help and advise the ryots in dealing with cattle disease.

(*d*) Travelling shows have been successful so far in the introduction of implements, but—

(*a*) it is necessary to encourage and support purchasers of novelties;

(*b*) to give advances to ryots to allow of their making purchases.

(*e*) Large shows must be ineffective at present. Award of prizes at fairs may possibly be beneficial. But special shows, in breeding districts where the breeding stock can be got at, will probably do great good. Places, *e.g.*, Hosúr, Ongole, &c.

(*f*) The above relate to cattle and implements; but, as to practices in arable farming, it is necessary to offer prizes for—

(1) farms and farm management;

(2) for particular crops to encourage introduction of new and improvement of existing crops.

(*g*) Experimental farms or stations are a necessity—

(1) to the conduct of agricultural inquiry properly;

(2) to the working out of problems connected with agricultural practice alluded to above.

Their utility lies in the working out of data on which to base reforms and improvements and their work must be conducted over series of years, and under varied conditions. They could be combined to a certain extent with "farm schools," and seed depôts.

(*h*) Agricultural inquiry—is a necessary preliminary to agricultural education and the preparation of text-books.

Should proceed from the general to the particular, and not on the opposite track as it too often does.

May be carried out partly by the offer of prizes for essays, as done by the R. A. S. E.

Must be supplemented by experimental research as already noted.

(*j*) Text-books—except as dealing with elementary scientific principles—the data recorded as yet do not suffice for their preparation. For educational purposes, text-books are an evil in teaching a practical art.

IV. The encouragement of self-help—

(1) Private effort must be greatly encouraged by the measures suggested for bringing home a knowledge of possible improvements to the people.

(2) At present there is little sign of private effort, especially amongst the classes who could really assist, *i.e.*, large landholders, mirasidars, and zemindars, and the Court of Wards on the estates in their charge.

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* If Mr. Robertson does not return, it will require an Agriculturist also.

(3) To foster private effort it should be organised, and worked by societies and controlled by a department advised by a Consultative Board.
(4) To encourage individuals, honors and rewards should be in the gift of the department.
(5) Only very few men can be mentioned as really trying by experiment to work out improvements.
(6) Government might encourage large landlords to start experimental farms for the purpose of testing suggested improvements—not necessarily for research—which should more or less resemble the home farm of the English country gentleman.
(7) District societies should be formed, in the first place by selection, to formulate the ideas of the people as to their agricultural wants, and to be the means of carrying out experiments for the department.
(8) These societies should send a deputation to an annual convention to be held by the department for the discussion of agricultural problems.

V. Departmental and administrative improvements.

This has been fully dealt with in my previous note, where I suggest an administrative bureau for agriculture, forests, arts and industries. Embracing—

I. Agricultural education, higher.
II. Agricultural improvement, general and pastoral, including cattle disease prevention.
III. Land and trade statistics, or records.
IV. Forestry and Botany.
V. Museums, Arts and Industries.

And in which I pointed out the evil result observed of the combination of agriculture with Revenue Settlement and the objection to continued combination with the Board of Revenue. I also alluded to the equivocal position of the Assistant Director at present and the possibility of remodelling the agricultural staff to better advantage, and mentioned that it is possible to reorganise the available staff and obtain as good or better effect from it, at a less cost than at present. The present organization is only suitable for a department undertaking a lot of work with ample funds. It appears that the cloth for the department is in the future to be limited and its coat must be cut, curtailed, accordingly. Under such circumstances, it does not appear to be of much value to counsel a system of perfection.

MADRAS, 1st March 1889. (Signed) C. BENSON.

APPENDIX J.

ORAL EXAMINATION

OF C. BENSON, ESQ., M.R.A.C., ASST. DIRECTOR OF AGRICULTURE.

First day—15*th March* 1889.

I have been connected with the Agricultural Department since 1874. I am a Graduate of the Royal Agricultural College, Cirencester. I was brought up in the country in immediate connection with rural pursuits and had practical experience as a farm pupil before going to Cirencester; the farmer's speciality was stock-breeding; he was one of the best in the West of England; he dealt with all classes of stock. My father's speciality was also stock-breeding. I was under 16 when I went to the farm, under 17 when I went to Cirencester. I came straight from Cirencester to India, arriving in 1874 before I was 19.

The preliminary inquiry to which I alluded in my letter, dated 11th December 1888, as the first object of the department, is the observation in the field and the record of all practices, combined with experimental inquiry into such modifications as might be suggested by the inquiry.

I had no opportunity for the first five years of any outside inquiry as I was engaged at Saidápet. The Board insisted on Mr. Robertson's going out on tours of observation, but he did not go until 1876 and did not want to go, and he did not send me. After 1876, the college work hindered him from going out during the greater part of the year: also the work of the farm. My own wish was to go, and I probably suggested that I should go. It was in 1878 that I had the first opportunity of going.

During these five years, experiments at Saidápet had not been suggested by observations such as I have above mentioned, but the Committee who had charge before 1871 had had opportunities of outside observation. Mr. Robertson's first tour of observation was in Coimbatore in 1876, except his tour in the Nílgiris. The experiments were not modified at Saidápet even after that tour; experiments were based upon the Government programme of 1871.

Q.—Was any valuable result obtained at Saidápet from the experiments made?

We established the fact that in South India fodder crops can be easily and economically produced; that crops can be produced under deep tillage with a minimum amount of rainfall when shallow-tilled crops fail; we dealt with the use of manures; and we showed that it was possible to produce fair wool-bearing sheep by breeding with careful selection from indigenous stocks.

There was no means for the dissemination of the results except by the annual reports and by the subsequent publication of the Farm Manual. The dissemination of information was also largely carried on by correspondence and by personal intercourse with the public, which was large.

For some purposes experimental farms are necessary. I would put one in the Ceded Districts. Such up-country farms would primarily be used to verify and confirm the results obtained at Saidápet, especially as to the growth of fodder crops, deep tillage, and the management and use of manures. I would also experiment on the economical use of water. In other words, I would primarily experiment in making stock efficient by good feeding, in tilling land thoroughly, in manuring it well and economically, and in economizing the water used in irrigation. I am convinced that fodder crops can be economically and profitably grown by the ryot. The object of experiment in manures would be to show a better management and application of manures now available and the use of waste matters not now availed of. A great deal of valuable information can be obtained at experimental farms. I would keep an

experimental farm going until the results of the experiments were placed beyond doubt; but probably one experiment would lead on to another. Observation without experiment is incomplete: what seems *primâ facie* useful must be the subject of experiment. For the above experiments, a farm such as can be tilled by two pairs of cattle would be the minimum, that is, up to 30 acres; buildings to such a farm might be 400 or 500 rupees, that is, 15 rupees an acre. Ten years is the minimum period within which experiments could be usefully carried on in the above matters; that would not solve all questions connected with them. At present, an Agricultural graduate is the best class of superintendent available. I am sure there are at least a dozen men who could now be found for charge of such farms, exclusive of the present students of the college, provided that they first acquire a knowledge of local practices, and are fully supervised and under due control; in Kurnool and Cuddapah I could start five farms at once. If the farms were my own private property, I would be content to start them under the above superintendents, if under due supervision; they could be trusted to record observations faithfully and correctly. A supervising officer with no other duty could inspect about five farms about once a month, if they were all on the line of rail, *e.g.*, Nandyál, Bellary, Cuddapah, Salem and Coimbatore. The average number of visits might be six a year. The maximum number of districts that could be so managed at first would be about five; because at first, the available superintendents would require frequent supervision; subsequently they would require less; and this would allow the supervision of a greater number. With a proper Sub-Assistant, such as Mr. C. K. Subba Row, a couple of visits from me per year would suffice. Mr. D'Silva would be equally suitable for such supervising work; this would enable me to supervise three times the number: the Sub-Assistants could supervise four or five if on the line of rail. Cost of working such farms would be about Rs. 10 per acre per annum, exclusive of superintendence: total cost per farm might be Rs. 1,000 per annum including the pay of the immediate superintendent.

The scientific experiments in superphosphate have produced successful results in practical agriculture: the results of such experiments are disseminated by journals, &c., amongst intelligent farmers; this is a single concrete instance of the value resulting from experimental research at home.

Exhibitions as hitherto conducted may have had some educational value, in showing something new to the people, but not commensurate with the expense.

Cattle disease operations have been conducted on too grand a scale, in that they have been spread over the whole country instead of being concentrated: the men should have been grouped into a moveable column: I would do so now if the present staff is not to be increased: concentration is the proper plan, a single area being taken up and thoroughly worked.

The present staff is too expensively paid as individuals; men, more of the salustry class on a pay of Rs. 25 to Rs. 30 as a maximum, are wanted; the training should be at a central school; the Middle School Examination would do as the preliminary educational qualification; the special course would be about a year long, in elementary practical agriculture with special reference to stock, in the elementary anatomy and physiology of farm stock, in veterinary sanitation and hygiene, in the treatment and management of stock in epidemic disease. I would have these men take the place of the present Stock Inspectors; they should be of lower qualifications and much more numerous, pay Rs. 15 to Rs. 30; a sufficient supervising staff should be employed, selected from the present Stock Inspectors. I would have ten to fifteen of these Sub-Inspectors in each of a circle of three or four contiguous districts, supervised by a Circle Inspector on the pay of the present Stock Inspectors; the seven circles would be supervised by three Sub-Assistants on a pay of Rs. 150 to Rs. 250; the total cost per month would be as marginally noted.

	Rs.
3 Sub-Assistants	700
8 Circle Inspectors at Rs. 75 each ...	600
70 Sub-Inspectors at „ 20 „ ...	1,400
Total ...	2,700

Referring to the statement that "the supply of good sires for the use of the public is a manifest duty of the Government," I am not inclined to believe that the ryot can get from private enterprise the cattle he requires for improvement though he

can for his present conditions and practices. Good dams are essential for breeding the best cattle, but a good sire even on a bad dam would produce better results than a bad sire and a bad dam. I doubt if ryots can get a sufficient number of good cattle, even if they are ready to pay for them. There would be a greater demand for good cattle if the prices were lower: I cannot speak from experience, but I consider it probable that prices are high, because the supply is limited as compared with the demand: in other words, that there is competition demand and that cattle-breeding profits are unduly high. I do not think that, under present conditions, these unduly high profits will work their own remedy, as the conditions of breeding are limited by existing stock and pasturage. The Coimbatore practice of cattle breeding in enclosed areas, I think, is a local and hereditary custom. Nellore cattle are very dear, considering the circumstances of the ryot: in the districts I know most of, viz., the Ceded Districts, I should say the ordinary cattle are unduly high priced.

The results from bulls placed by Government at various stations has not been very traceable: at Saidápet, the buffalo bulls certainly made their mark on surrounding cattle: I think that Government bulls have had some effect where they have had a chance as at Saidápet; as regards others, the results have not been traced.

Regarding my opinion as to the injuriousness of the connection of the Settlement Department with the Agricultural, I base my opinion partly on the fact that external correspondence, which was considerable, disappeared subsequent to the connection. I think that Mr. Robertson was previously looked upon as independent and was therefore freely corresponded with. I went through the correspondence in 1884 and 1885 and found the diminution, but I cannot give figures. I found no reason entered in any of the letters, but I merely state the fact of diminution. Also people suppose that "Settlement" is the chief work of the department; an officer selected as Director may often be chosen specially for his qualifications as a Settlement officer, and might care nothing for agriculture. I believe it to be a general opinion that the Settlement Department inquire into agriculture with a view to enhance assessments.

There should be a special department embracing Agriculture, Forests and Industries, the latter including technical education, and trade in the products of industry. Settlement should be transferred to Land Revenue, and Forests transferred to Agriculture.

Among the items of practical work to which a reorganized department would at once devote itself would be inquiry and experiment, and the dealing with cattle disease. I consider that the time *has* come for experiment: we already have a considerable knowledge of general practice. The true rôle of an Agricultural Department in this country at present would be experiment and research; not of course that these would be the sole objects, but they would be the means of ascertaining what improvements can really be made.

Regarding itinerating instructors, I am not personally aware as to the measure of success which has attended them in Austria and Ireland.

My objection to example farms for the demonstration of successful experiments is that they will be useless: it is a matter of general experience, and would be specially the case in India, that the *ordinary* farmer does not copy: there must first be a class educated to understand. I don't think the adult ryot, as he is at present, will appreciate mere example any more than the ordinary British farmer. I do not expect in my time that the ryot will do so. I would make the results of experiments known by education: it is a future generation that will benefit, not the present: little result can be expected in ten years. Prizes for experiments by ryots might be successful in inducing them to adopt improvements as under the prize farm system.

I consider it the duty of Government to promote agriculture as being an art absolutely essential to the existence of the people.

I consider that capital is not sufficiently devoted to the land. I say this from my general observation of practice, *e.g.*, wells, terracing, clearing of stones, draining, tree-planting, fencing. The high price of money is one obstacle to devotion of capital. Government loans are not resorted to in my opinion, from what I hear, because for one thing, the money does not reach the ryot, as it sticks on the way; the rigid demand is another objection. Capital may not be attracted to land, because it may pay better to devote it otherwise.

Agriculture is, in my opinion, regarded as a base employment by modern educated men, whether Brahmins or Sudras: I mean the personal management of a farm is so regarded, even though it does not actually involve manual work, such as ploughing, manuring, &c.

In saying that questions regarding the directions in which the improvement of native agriculture is possible and should be prosecuted, can only be answered satisfactorily by persons who speak with a full acquaintance with the practice of the art, and have a full appreciation of the difficulties which beset the ryot in practising it, I do not exclude from the administrative officers the function of suggesting points for inquiry by the experts.

18*th March* 1889—*On the second Note.*

* I (*a*) (1) At present land can be taken up and cropped in a racking manner, and when exhausted can be thrown up: this is practically exhausting the State capital in the land. I would put an upset price on the occupancy right: would thus check mere extension. I would base the upset price on so many years purchase of the assessment. Land thus paid for would not be thrown up. I consider this rule would be generally a proper rule, though there may be cases in which it would be desirable to extend cultivation. If an upset price is charged, it would tend to induce the application of capital to lands already in cultivation, in other words, to intensive cultivation rather than to mere extension. I consider that in view of the very precarious nature of the crops on poor land, it is far better to cultivate highly lands already under cultivation.

I (*a*) (2) A man at least ought to have a pair of cattle. If an upset price is demanded, this, viz., the value of land, would itself form an asset of the man's estate. I would subject all waste lands in general to this competition: the minimum should be ten years' purchase of the assessment.

I (*a*) (3) The above limitations apply to *arable* farming, not to lands taken up for pasture.

I (*a*) (4) Legislation is necessary to prevent undue sub-division.

I (*a*) (5) I consider that local effort might induce the practice of home-stead farms, *e.g.*, by free sites, grant of drinking water-supply. I would not extend existing village sites, or allow rebuilding on house-sites that have been vacated; village unions could work on these lines.

As regards exchange of lands, I would facilitate this by a proper registration of titles; persons would be willing to exchange if titles were clear.

I (*a*) (6) Fifty acres would be a minimum unit for a grazing farm; this would probably carry 10 head of cattle and would work in with the arable farms. I am aware of places in Kurnool where areas from 1,000 to 50,000 acres can be got in a block. I would encourage these grazing farms by not putting any upset price on such lands and by charging only the ordinary or even a lower assessment. I consider that encouragement of grazing as against arable cultivation is very important, and that this would encourage it.

I (*b*) (1) This statement is based on the declaration in the Madras Manual of Administration, Revenue Settlement, paragraph 115, where it is officially declared that grain values are liable to alteration. If grain values are, as now stated, unalterable, that makes the tenure perfectly stable.

I (*b*) (4) I specially referred in this remark to the Kurnool irrigation canal. I would have had this on a different alignment: the land, at present commanded, is not suitable for irrigation: if differently aligned, it would have commanded land more suitable. The soil now commanded is black soil chiefly: it is not the same as the Kistna black soil, which is probably largely alluvium. This is the only big unsuccessful work which I had in mind in making the suggestion.

I (*b*) (7) Land ordinarily commanded by a well may be about 3 acres; the ryot chiefly works such areas with his own and family labor.

I would not remit above two-thirds of the assessment for thirty years.

References are to sections, paras. and clauses of Note of Suggestions dated 1st March 1889.

By safe-guarding improvement, I mean the safe-guarding of the ryot against any alteration of the grain valuation.

I (*b*) (8) I do not consider trial borings a necessity. I would examine the subterranean water-supply, gauging it by observation of existing works and the nature of their supply whether as to quality or persistency; and also the quality of the land which might be irrigated by further wells. I would confine loan operations for wells to localities where they are likely to be useful: such inquiry and report might be made by Revenue Inspectors.

II X By the expression "combined with the loss of power to relinquish land," I meant the inability of ryots in many parts to give up land in regular cultivation as it would be taken up by others; the ryot cannot afford to give up and thus rest his land as he used to do. Speaking generally, lands now in cultivation get no rest. Rest can only be got by fallow or by change of crop.

II X (*a*) (1) Difficulties in the way of change of implements are adherence to custom, conservatism, &c. In the case of the plough, people are doubtful of its success, and whether they can do anything with it; they have often been led to expect too much; *e.g.*, it has often been asserted that the use of such a plough will give a better outturn; this may follow, but not necessarily. Price is another objection that is raised, but would probably disappear if suitability were proved. Difficulty of repair is a more serious objection even in the case of big ryots. Fear of draught is also an objection raised, not altogether a valid objection, for a large proportion of the existing cattle are fully able to draw the improved ploughs; but all cattle all over the country are not able to work the existing improved ploughs efficiently.

II X (*c*) To carry out a system of selection and pedigreeing seeds, a seed-farm would be necessary. Even a mere seed depôt requires land for trial of the seeds. A local society would probably not have the means for obtaining good or new seeds; an Agricultural Department would have the necessary knowledge and means, and would supply seeds to the societies for the use of members and other ryots; success or otherwise of such seeds could be reported on by the local societies primarily, or by local officers.

II X (*g*) I consider the chief evil of late harvesting to be the deterioration in the quality of the fodder. Experiment would determine the best time for harvest in the case of the various crops, and the results would be disseminated by education.

II XX The agriculturist mentioned in this paragraph should be a European, who should be a Stockman first and Veterinary Surgeon afterwards; for our money and work, the stockman thoroughly trained in the management of cattle is a primary necessity; the Inspector now available would be more usefully utilized in educational work. I believe in prevention of disease, rather than in doctoring it.

The assistant or deputy mentioned in 7 (*f*) below should be a trained agriculturist who should subsequently be passed through a veterinary course; that course would be similar to that in the veterinary syllabus for the higher technical examination.

The staff would be the head of the Stock department; the Sub-Assistants, the Circle Inspectors, and the Sub-Inspectors, as noted above; the Inspectors and Sub-Inspectors usually, but not necessarily, to work in a group in the localities most needing them.

Education is the chief motor to improvement everywhere. Persuasion and influence towards a better management of cattle are more advisable than attempts to cure disease by direct treatment.

II XX (4) The general defects in the system of breeding are want (1) of judicious and selected mating, (2) of changes of sire, (3) of care of cows, (4) of a proper system of feeding and management.

II XX (7) (*a*) Losses by cattle disease are not great compared with the value of the stock in the country; absolutely they are considerable: some ryots are ruined by their cattle being swept away; they are attributable to causes mentioned above, XX (1).

II XX (7) (*b*) The danger in using a legislative enactment lies in the abuse of howers which may be granted to men not under complete supervision. For "legislation" I would substitute the words "the present law." I consider that legislation might improve the existing law so as to make it a practical force provided the danger of abuse

could be got over. Action such as prosecution under such a law should be taken as seldom as possible, but the law would give the necessary weight to the executive. To work the present Act an enormous staff would be necessary; it would, however, be possible to work through the village heads if there were efficient supervision. I would not, however, use the plan of hospital pounds, or the powers of the Act unless it were actually necessary. I would improve the present Act—it being in existence—rather than drop it.

II XX (7) (*c*) The suggestion as to the utilization of the Revenue staff is an alternative one. Revenue Inspectors might be made competent by giving them the same training as a Sub-Inspector at Saidápet; this training would be sufficient. Sub-Inspectors should be trained at a central institution such as Saidápet.

II XX (7) (*d*) Some of the present Stock Inspectors may have some influence over the people: I am of this opinion from the records of their work and from statements made by officials. I do not think that many of the eighteen or nineteen Inspectors would have such influence: perhaps half a dozen. I doubt if the influence of Tahsildars has been fully brought to bear in this matter, as in inducing proper sanitation, disposal of carcases, &c.; such suasion is necessary in the introduction of a system of better treatment. I would not exclude Brahmins if they are suitable; Eurasians would find difficulty in getting accommodation in the villages in their wanderings over the country. The ordinary salustry of the country would be a very good man if he could be got hold of when not too old, and could be fairly well trained. Candidates for the subordinate staff dealing with cattle and cattle-disease should be obtained by selection so as to secure a proper supply of Sudras and Muhammadans. Sub-Inspectors should be selected, as far as possible, from within their own circles. Sudras would probably get on with ryots better than Muhammadans. Men for the Circle or Stock Inspector class should be selected from men who have passed the Middle School examination. Sub-Inspectors might be similarly selected if possible; they are likely to be effective in proportion to their education.

II XX (7) (*e*) If money were available, it might be better to have an entirely separate staff to deal with cattle-disease, but with the present resources, it is not advisable to specialize; it is largely a question of money. Even with present resources, we could go on with experiment, such as the growth of fodder, manuring, implements, use of water, &c., if the money now spent in sericulture and pony-breeding were utilized. Circle Inspectors would be able to give local advice as to experiments with seeds, crops, implements, &c.; they would make suggestions and give advice as to getting over difficulties.

Circle Inspectors should have a general agricultural training, but Sub-Inspectors should have to do with stock only, their agricultural training having special reference to stock.

This suggestion is based upon the present limited means, but, if money is available, the staff might be duplicated.

III (*a*) There are no text-books at present available for teaching lads in primary schools; nothing yet suitable for boys even in Upper Primary classes. Text-books should be for the guidance of the teachers rather than for the boys. Readers for children do not exist. As for text-books for teachers, a work now in hand by myself and Mr. Subba Row, and which only awaits printing, will, it is hoped, be suitable.

III (*a*) (1) The "qualified teachers" are teachers required for elementary rural schools.

III (2) (*a*) Such teachers should be trained to teach agriculture; for this, a farm attached to the Normal school is necessary; there should be instruction in the field and in the school. Probably some hired labor would be necessary on the farm attached to the school; this would be pretty certain as men could not work all day on the farm and also in school. But before giving a decided opinion as to what hired labor is needed, I should require the details of the number of students available, the time that could be given to manual labor, and the area and purposes of the farm.

III (*b*) Wards of the Court should, I think, be brought under some scientific agricultural training, especially in cases where a man is likely to have the immediate management of his estate.

III (*b*) (3) The Agricultural Department knows best what is wanted for agriculturists, and should therefore have the control of their training. It is true that the present institution is chiefly collegiate; one of the aims of the staff of an Agricultural College, viz., research, has dropped out. I do not think that the training by the Educational Department, even though they were informed of the wants of the Agricultural Department, would be so successful as if it were directly controlled by the department. A college of agriculture should be the centre of research. I consider from what I have gathered that there is danger of so loading the Professors with tutorial work that they would have no time for research. The Educational Department would make them mere teachers and not experimenters. At Cirencester, the Chemical Professor lectured for six hours a week; here the Professors are expected to lecture four hours a day each, which is excessive. The Agricultural Department would utilize men for research and not make mere teachers of them. Moreover, taking the analogy of the Medical College where all hospital work is under professional superintendence, all farm work at the college should be under the Agricultural Department. I don't think that the cases of the Medical and Engineering Colleges are analogous; the Agricultural College is in its infancy; the system is only under process of adaptation to this country; for instance the syllabus for the college was drawn up by the Department of Public Instruction and is a failure; it has been attempted to work it in as part of a system of higher technical education which is for general application, instead of making a practical syllabus such as agriculturists would have devised had the object been agricultural education only.

III (*b*) (4) The direct aim of the department is the improvement of the greatest industry of the country; I, therefore, consider that education in that industry should be free.

I do not know what the present condition of the college is as to free and paying students: the first two classes were easily filled; there was subsequent difficulty in filling the college: the classes were even stopped; the number of scholarships were reduced from 15 to 5. The reason for the difficulty in filling the classes was that there was no demand for the services of the graduates.

I consider that a high class institution is a necessity.

I think that endowed studentships are at present necessary.

The object of the special instruction is to improve the practice of the art: any man who is going into the Revenue Department is justified in seeking such instruction as he is going into a land department. There are also men who have taken up agriculture as a business: I know of one, at the Red Hills, who took up land and cultivated it. I have not heard of him for some time.

III (*b*) (6) I do not think that farm apprenticeship at present is possible. I believe that no man should get a diploma who, besides his theoretical course, cannot show that he has been directly connected with the land and its management for two years with a final examination thereon. Two years *bonâ fide* spent on any farm would be admissible if the student had taken actual part in its management. If there were such a standard, it would be worked up to; there would be no difficulty in ascertaining the facts as to a man having actually worked on a farm.

I do not think that a preliminary knowledge of practical work before entering a college is an absolute essential, but it is an advantage.

III (*c*) The same staff would avail for cattle disease as for itinerant instructors; they would be the Circle Inspectors.

III (*d*) Men often get alarmed and puzzled by novelties, and itinerant instructors would keep them in heart by advice, encouragement and explanation.

Advances for the purchase of implements are, I believe, permissible under the Agriculturists' Loans Act, but this does not seem to be well known.

III (*e*) Large shows are not entirely ineffective, but are so in proportion to their cost.

Breeding cattle, especially cows, have not yet been much affected by shows; the cows have not been brought to shows: they ought specially to be encouraged as that is the point in which breeding is at present most defective; viz., the care and management of breeding cows. Prizes need not be big, if the men are not taken away from

their own neighbourhood. I would approve of a revival of the Ongole shows, and would have them also at Kangyam and Hosúr.

III (*f*) I consider the *idea* of the prize-farm system right, but foresee difficulties in carrying it into practice.

III (*g*) I would have experimental stations dealing at first with specific items of general practice. I do not think that the tobacco experiment to be of this nature since it is an experiment in farm industry rather than in farm practice. The adoption of an improvemont demonstrated by successful experiment in such a matter would not argue the adoption of an improvement in general practice, similarly demonstrated. Such adoption is only probable after education has developed the power of appreciating deferred results. I consider agricultural education is a matter of the first importance since an educated agricultural class can alone appreciate the results of experiments. Education is of course not to be mere school education, but include education by all the methods referred to under III.

On the 20*th March* 1889.

III (*h*) Agricultural inquiry should proceed from an acquisition of a knowledge of the conditions affecting, influencing and controlling the *general* practice to a scrutiny of the details of practices which affect only *particular* or exceptional crops, and have little or no bearing on the general system. The results should similarly be presented for the general practices before dealing with those which are particular or exceptional. There is a general practice which underlies all special practices; *e.g.*, if examining the growth of cotton, I should first inquire into the general practice of the district; I should first ascertain the position of cotton in the general system of cropping; then I should note the general practices of tillage, manuring, &c., throughout the season; only after that I would go to the special practices followed for the cotton crop. There must be a general grasp of the ordinary practices before proceeding to inquire as to the practice regarding a particular crop. A man should be an expert in the general practice of an area before taking up the examination of a special practice.

III (*j*) It is not possible to write a manual of South Indian Agriculture without previous inquiry and experiment and more information than we yet have; mere text-books of general principles could be even now written. Nor could a manual of general agriculture be written of reasonable size for the whole Presidency. Text-books in teaching a practical art are an evil in this way; a text-book if written to suit general conditions is useless as regards special conditions; or again text-books for special parts of the country would be useless in areas differently circumstanced. From the experience mentioned in the Dairy Schools' Commission report, I note that examiners, such as Messrs. Wrightson and Tanner, find the examinees to write only in a groove and are apt to quote text-books in their answers; teaching should be in the field. A text-book can only deal with general principles, and must be dogmatic; it cannot be so written as to suit the varying conditions of agriculture. It would, for instance, be practically impossible to write a manual of Southern Indian Agriculture for the Saidápet College; it would require to be of immense size, only the general principles could be laid down; details alter according to conditions, and therefore such a book could not be kept within reasonable bounds. In farm-schools, I would not give text-books to pupils; the master might have them, but he would have to work out the general principles into actual practice on the farm.

IV (3) A department could considerably control an agricultural society. Money and men could be given for experiments. I do not consider supervision by experts an absolute necessity in all experiments which might be conducted by societies; but it would probably be advantageous in most cases at present.

IV (5) Large landlords could be stimulated by judicious rewards or honors, if they had reasonable confidence that they would be awarded for actual effort.

IV (7) A good district officer could, I believe, find men who would do useful work if properly organized and united as an association. The decay of the "Madura Farmers' Club" is not conclusive as to the ephemeral nature of such societies; I consider that that club might be revivified. A society in connection with and continually stimulated by a department having a fixed policy would be comparatively

independent of the particular officials for the time being, if good men were selected at the beginning. The men should of course be educated sufficiently to understand the necessity for improvement. Continuity would be secured by a practical department with its agents in all districts. From what I have seen and heard of Tinnevelly and its men, I consider that a successful society would be very possible there.

(*To Mr. Grose*).—The following written answer to question (I) has been submitted.

Reference.—Examination before the Agricultural Committee on 20*th March* 1889.

"The Honorable Mr. J. Grose asked me to submit a note of—

(1) The evils in, or improvements to, practices now prevailing in native agriculture which are known?

(2) What improvements can be introduced without further enquiry or experiment?

2. Noting these briefly, and taking Stock management first, I consider that the evils of—

(1) Promiscuous breeding,
(2) Want of shelter,
(3) Want of provision of pasture or other fodder at certain times of the year,
(4) Over-feeding at others,
(5) The absence of the most ordinary sanitary precautions, as to housing, watering and pasturing stock,
(6) Want of good sires in many places, and the non-exclusion of bad and ill-formed sires from the possibility of crossing,
(7) The absence of judicious mating between sire and dam,

are more than *primâ facie* established. I hold them to be known and therefore that improvements can follow direct on their removal. Improvement in sheep breeding may be specially devoted to the growth of good wool.

3. As to the practices of Arable farming. I consider that it is a known evil—

(1) That the native plough works so slowly.
(2) That in some parts so much trust is placed on the *guntakah* and the *gorru*, and
(3) That, consequently on the two preceding evils, tillage is too often shallow, superficial and expensive.
(4) That the practice of extracting such deep-rooted grasses as *hariali* on black cotton soil with a plough is not known or practised in the southern districts.
(5) That the seed-drill of the Ceded Districts is not known or used in the south, with its attendant labour-saving implements the bullock hoes.
(6) That opportunity to plough land immediately after harvest is so often wasted, both on dry and wet land, to the exclusion of the practice of growing catch-crops or of fallowing the land thoroughly.
(7) That the practice alluded to in 6 is particularly noticeable in the case of wet lands, not only immediately after harvest, but also after the fall of a shower of rain. Time and opportunity are thus lost, the land remains foul, puddling has to be resorted to, water is wasted for that process, and the cost is increased.
(8) That the practice of puddling is, as a general one, injurious, as it encourages a surface-feeding crop, causes waste of water, labour and time, prevents drill-sowing and after-cultivation. Under some conditions the puddling system is convenient and advisable.
(9) That cattle dung is generally left exposed in the open to washing, drainage, and the action of the atmosphere; is often burnt, and is, to a large extent, used for household purposes.
(10) That the urine of cattle is so seldom preserved.
(11) That it is not recognised that in the dung the value of artificial foods fed to stock may be returned to the land.
(12) That sheep folding—that is, close folding—is not more generally practised and that sheep and goats are so much dependent on what they can pick up for their subsistence, their manure consequently being of the poorest.

(13) That all the waste products of the farm, *e.g.*, weeds, leaves, &c., are not thoroughly composted and utilized as manure.
(14) That bones are not utilized as manure and that other waste portions of the animal frame are not utilized, *e.g.*, night-soil.
(15) That the practice of green manuring is not general.
(16) That irrigation water is too often lavishly used simply for manuring purposes and so in a degree wasted.
(17) That the late harvesting of paddy causes a risk of loss of grain and probably deterioration of the value of the fodder.
(18) Following from 17, the loss of fodder in the long stubble so often left in reaping cereals is an evil.
(19) That threshing may be more economically performed than by the usual practice.
(20) That winnowing being dependent on the wind and weather, the ryot has to thresh his grain too early.

4. Improvements in all these cases are indicated. They are almost entirely details of general practice and though further enquiry and experiment may add to our knowledge of how the improvements indicated may best be carried out, it is not necessary to enable us to indicate improvements. These may be mentioned :—

as to 1, 2, 3.—The introduction of improved ploughs is indicated.

as to 4.—The use of large ploughs, and those of improved patterns, drawn by several yoke of oxen, is indicated.

For 5.—The extension of the use of the bamboo seed-drill and the bullock-hoes now in use—and their improvement.

For 6, 7 *and* 8.—The extension of the practice common in places of ploughing early and at any opportunity, and of ploughing up and sowing " dry " wet land with paddy or other crops.

For 9 *and* 10.—The preservation of cattle dung, with the other refuse referred to in *13*, in pits, where proper fermentation may be secured, and the protection of the manure heap from the sun and the rain, and the preservation of the urine of cattle by stalling them on good sound floors, or in boxes, and adding it to the manure heap.

Nos. 11 *to* 15 indicate the necessary improvement in each case, as does *No.* 17 ; whilst, with reference to the latter, the practice of earlier harvesting is probably advisable in the case of all cereals.

No. 18 indicates the remedy which would probably follow on improvement under 17.

Under No. 19, a remedy as to cholum has already been found in some places.

And lastly under (20), the winnowing machine, perhaps not yet fully perfected for Indian conditions, is a remedy.

5. There are no doubt other evils to which improvements could be indicated, but the above, I trust, will suffice as examples in answer to the question put.

To Question (2).—Bourbon cotton has probably deteriorated, because the seed is deteriorated; but I am not acquainted with that cotton, and it may now be a mere hybrid. The loss caused by continual in-breeding from seed cannot be specifically proved out here; but good cholum brought down from the Ceded Districts deteriorated in two years on the Saidápet Farm. I believe that seed-depôts are necessary to distribute new seed, as shown for instance by the case of barley on the Nílgiris; there is nothing in actual *evidence* to show that the improvement of seed is radically necessary.

To Question (3).—There is evidence that better ploughs are necessary to prevent loss ; it is established that there is now much loss of time and loss of crop by the use of the present plough; even taking into consideration the increased cost of the improved plough, I am of this opinion. A mould-board is necessary to complete the work of an English plough ; without that it would be little more than a native plough, but would still do better work.

We have not yet got a plough which would suit all classes of wet land, *e.g.*, for heavy clayey wet soils we have no proper improved plough ; native tillage in such cases is practically performed by the treading of the buffaloes.

To Question (4).—According to my information no improved oil-mill can be made to compete with the present oil-mill.

The seed-drill is a very important implement, *e.g.*, to facilitate after-tillage, &c.; with this would follow other implements, such as bullock-hoes.

Threshing machines save an immense amount of labor, *e.g.*, the stone-roller used in parts of Kurnool and Anantapur will, with one pair of cattle, do as much as several pairs (nine, it is said) on the ordinary treading system.

To Question (5).—Without nearly the whole amount of *pure mathematics* demanded by the syllabus, the student could not get through the surveying and mechanics that he ought to know: the syllabus might, however, be slightly curtailed. As to *mensuration*, a good deal might be omitted ; it should be retained, but modified and simplified. Regarding *building materials*, &c., it should be much as bracketed. As for *statics*, &c., it should be as bracketed. As for *forestry*, I consider that so much as is absolutely required for an ordinary farmer is contained in the agricultural syllabus; the remainder might be omitted.

As for utilizing the student's third year in practical farming by omitting parts of the syllabus as proposed by Mr. Keess, I consider that these items should not be dropped otherwise than as stated above, and the practical training should not be at Saidápet except that the Principal should take the students on periodical tours for practical observation and instruction in various parts of the country. I have not, however, thoroughly studied Mr. Keess' proposals.

The agricultural syllabus should be split into two; agricultural chemistry and geology should be separated from the agricultural syllabus and taken up as a development of the pure chemistry course; practical agriculture should be separate, and taught by a man having particular knowledge and experience. The subjects would not be reduced, but better treated.

It is found in practice at the college that even the bracketed portions in chemistry, &c., have to be taught as the brackets are not sufficiently regarded by the examiners; hence I consider that the syllabus should be drawn up specially for the college and not form part of a general syllabus adapted for various purposes. Similarly in the case of animal physiology, examiners are apt to ask questions referring to human physiology.

Regarding the abolition of the junior course recommended by Mr. Keess, I would say that for veterinary men of the lower grade it should be retained with modifications.

To Question (6).—I do not consider that the ordinary master of a District Normal school should at all be called upon to give instruction in agriculture; such instruction should be given by a special instructor as indicated in III *a* (2) of my note of suggestions. For these normal school instructors I would insist on the *diploma course*, including the two years' course of practical work on a farm, as suggested for agriculturists in general; such practical course to be followed by examination. The practical work might be *before* the theoretical training if declared beforehand and duly proved.

To Question (7).—As to Mr. Keess' plan of a large farm *annexe* to the college, I consider that it depends on his scheme, of which I am not in favor; for such a scheme it would be necessary, but I don't approve of the scheme. The present annexe is enough for present class purposes.

To the Chairman.—The classes were too large for practical teaching in the field, when I was at the college, for individual attention to the students.

To Mr. J. Grose.—To Question (8).—I cannot say from my own experience that cattle are *deteriorating*, but that seems to be a general opinion.

As regards the special question of the diminution in number of temple bulls, I cannot speak with confidence; but they have not been very common in most parts that I have visited, except near Hosúr, where the "gooli" is a regular institution.

I should say that the proportion of poor cattle has increased relatively to that of good cattle, but as to the deterioration of breeds, I cannot speak from experience. Probably in former days there was more pasturage available for the number of cattle then in existence, but I don't think there is any actual evidence to prove deterioration of particular breeds.

To Question (9).—I don't think that earth-salt is better than sea-salt for cattle. I know of no reason why it should be. I don't think that salt itself can be called an absolute necessity for cattle, but I believe it tends to prevent epidemics by keeping cattle in better health. There were great cattle plagues in Kurnool when Mr. Thacker was sent up and when there were no restrictions against the use of earth-salt. I saw no symptoms there of animals being dirt-eaters which would be the case if salt was an absolute necessity. Salt does improve digestion, assist nutrition and kills parasites; the food is much more readily assimilable by the use of salt. Chlorine is essential in certain functions of the animal economy.

To Question (10).—Regarding the re-introduction of exotic seeds, I am unable to speak definitely as regards Bourbon cotton, as I personally know nothing of it, or whether the so-called Bourbon is not now a hybrid. As regards maize, it has much deteriorated since introduction, both in grain and ear; experiment is not required to prove the value of its re-introduction; that is a certain improvement, but local growth is advisable for acclimatization purposes; a season would adapt it to local climatic conditions, but it would still probably deteriorate from other causes; it would not take a settled status in a season, but fresh introductions would still be necessary. I would introduce exotic seeds, known to be suitable, such as maize, grow them so as to increase their quantity and acclimatize them, and then distribute them, selling them, if necessary, to the ryots, by which plan the cost would probably be recouped. I think ryots would buy them.

To Question (11).—The department should, I think, nominate for honors, rewards, titles, &c.: the members of district societies might, for example, be called "Councillors" or by some suitable honorific title.

APPENDIX K.

JOINT REPLY TO THE INTERROGATORIES OF THE AGRICULTURAL COMMITTEE,

By W. KEESS, Esq., Acting Principal, College of Agriculture.
M.R.Ry. G. KRISHNA PRABHU, First Assistant.
S. L. D'SILVA, Esq., Acting Second Assistant.
M.R.Ry. C. KRISHNA MENON, Fifth Assistant.

Question VII—Agricultural Education.

(*a*) The great majority of the students are Hindus and belong to families holding land. Brahmins constitute the largest proportion of the students. The distribution of the past and present students of the College according to castes and nationalities is as follows :—

Europeans, Eurasians and Native Christians	29
Muhammadans	15
Parsees	18
Brahmins	156
Sudras and others	64
Total ..	282

Most of these students are Matriculates. The remaining number is made up of those who have passed only the Middle School or General Test Examinations, a few F.A's., two Graduates who have taken Degrees, and two more who have passed in the Language Branch and have to complete the examination for the Degree.

(*b*), (*c*) Students in the College may be classed as scholarship students, free students, and paying students. Scholarship students are nominated by Collectors, and free students by Collectors and by the Principal, and all are appointed by the Director of Public Instruction.

The rules in force from the year 1882 up to October 1888 as regards the selection of students by Collectors were—

(1) That, when practicable, Collectors shall select for the studentships the best men available amongst the younger Revenue officials, or candidates for service under Government in the Revenue Department.

(2) That, if the student be an eligible candidate for Government service, he should be sent to the College on the distinct understanding that he will be provided with suitable employment in the Revenue Branch of the service on the satisfactory completion of the course.

When selection was made by the Principal, young men connected with rich land-holding families or having superior educational attainments were preferred.

The Collectors and the Principal were to choose candidates who had passed at least the Middle School Examination in the Second class and could produce certificates of physical fitness and character.

Present rules.—Collectors nominate without any promise as to future employment.

(*d*) In order to appreciate the results, it is extremely important to bear in mind that the main objects of the institution have been to "train men for employment in connection with Government efforts to improve native husbandry" or as subordinate Land Revenue officials.

(1) There is ample evidence to show that the results of their education on the agricultural students have been extremely good. The College of Agriculture is worked almost entirely by old students of the College. Mr. Krishnaswami Mudaliar's work at Shiyáli was developed by an old student. A number of students have been taken into the Forest Department on account of their special training. One of these has risen to the post of Sub-Assistant Conservator of Forests. He is not a graduate or an under-graduate, and his rise in the department can only be due to his special knowledge. All Stock and Agricultural Inspectors are old students of the College and are

doing good work in their respective capacities. The fact that the executive work of the Agricultural Department was, for three months, conducted by an old student is very important, as it shows what the students of the College can do if proper opportunities are afforded to them. There are old students in the Bombay Presidency who have been equally successful. One of them is a Forest-officer on a salary of some Rs. 400 a month. Another is a successful farmer, who was for some time in Mozambique on a salary of about Rs. 800 a month, having been sent to instruct people there in the management of Poppy crops. Others are employed as Agricultural Instructors, Superintendents of Farms and Gardens, or in farming their own land. The high salaries which some of the students draw form an index to their worth. It is not of course meant that every student of the College has been successful either as an agriculturist or a public servant. Success in any walk of life depends not only on special knowledge but also on promptitude, business habits, quick-sighted observation and tact in managing subordinates which no technical institution can develop to the required standard in every one under instruction although it may train such qualities more or less in all.

(2) There are students, as shown below, who are farming for themselves or farming land belonging to their relatives; and as already remarked in the case of the Shiyáli estate, where a rich land-owner has sought the aid of a student in managing his estate, the student has been able to do good work. Others not engaged in farming have given advice freely on agricultural matters. But such advice has not been productive of good, because ryots, who are slow to adopt an innovation even when the utility of it is demonstrated to them, will rarely make use of any advice not supported by demonstration. Some students of the College have translated or written books on Agriculture and Veterinary Art, and some more are collecting information for the same purpose. There is an Agricultural Journal conducted in Canarese by some old students, and it is under contemplation to start a Telugu Journal. A certain student of the College wrote an Essay on Irrigation, for which he obtained the First Prize at the Madras Agricultural Exhibition, 1883, competing with certain Royal Engineers and a retired Conservator-General of Forests. He has also recently written, under the supervision of the Assistant Director of Agriculture, an Elementary Text-book of Agriculture for the use of schools.

Certain students of the College successfully exhibited rare and interesting exhibits of economic importance at the Agricultural Exhibitions, such as excellent fibre prepared from a wild plant called in Tamil Ottaraipoondoo (*Triumfettia rotundifolia*), a crimson dye prepared from Amber sugar-cane seed, oil extracted from silk-cotton seed which is at present almost wholly wasted, a dye obtained from the mill refuse of Amber sugar-cane, jaggery prepared from the stems of Amber sugar-cane, excellent flour prepared from Cingar nut (*Trapa bispinosa*) which may be profitably cultivated in large bodies of water, fibre from the stems of the Ganja plant (*Cannabis sativa*), &c. The total amount of prizes won by one of the students is Rs. 565, and by another Rs. 170. A certain student of the College has obtained orders for filing a specification for two innovations, viz., an Improved Bucket and an Improved Water-lift. The Water-lift has been exhibited at some Exhibitions with success. Thirty water-lifts of the kind have for the present been ordered of him by the Mysore Government and some more by sundry persons. He has also made material improvements in the Double Mhote so as to reduce the outlay required for its erection and to increase its efficiency. He has also invented with partial success a seed-drill which does fair work, though needing considerable improvement. It is probable that if other graduates of the College had the same opportunities, many of them would have likewise benefited the cause of Agriculture.

A student of the College has admittedly been very serviceable in collecting information for the Manual of the Coimbatore District. A student of the College who has not completed his course was awarded a Certificate of Honorable Mention at the Bellary Exhibition, 1888.

Several students of the College have at different times voluntarily demonstrated at their own expense the use of improved ploughs, &c., and have succeeded in selling many implements. Two of them were recently thanked by His Excellency the Governor.

It must be added that it is impossible for a handful of men widely scattered over an extensive country in the midst of a vast conservative population to produce, in the short time that has elapsed since the first batch was sent out (*i.e.*, 9 years), any marked influence on the progress of agriculture, the knowledge of this subject having been found in all countries where any attention is paid to it to be very slow both in its growth and diffusion.

Enough has been said to show that students of the College can render good service to the country if placed in proper situations or afforded opportunities to show what they are capable of. Agriculture now is in the same position that Western medical art was some time ago. There was once a strong prejudice against this art. The alteration in the public opinion in favor of it is due entirely to students of the Medical College having been placed in charge of dispensaries and hospitals all over the country and afforded opportunities of demonstrating the value of their knowledge. If agriculture is made a subject of instruction in mofussil schools and certain inducements be offered to students to become farmers as suggested in subsequent pages, a great impetus will be given to the spread of agricultural education and opportunities allowed to students to make the best use of their knowledge both in their own interest and the interest of the country at large.

Old students of the College are employed as follows:—

Those who are farming or are in charge of Farms and Gardens	39
Importers of Improved Implements	1
Instructors in Agricultural Schools and Colleges	6
Demonstrator of Agricultural Implements	1
Agricultural Department	17
Veterinary Department	25
Revenue do.	61
Forest do.	29
Salt do.	2
Police do.	2
Sanitary Inspector	1
Pleader	1
Editor of Agricultural Journal	1
Assistant Curator in Government Museum	1
Merchants	4
Unknown	24
Total ..	215

It is certainly desirable that more students of the College should adopt agriculture as their occupation in life. But the old students of the College cannot be blamed for not having done so, as the rules from the very beginning made them believe that they were mostly intended for Government service. Besides, it must be seen whether there is a healthy public opinion on the subject. Agriculture in this country is considered a menial occupation and quite unworthy of educated men. One who becomes a farmer falls considerably in the estimation of the public. On the other hand Government service is attractive, for although one is badly paid at first there are prospects of promotion. Students themselves know the value and dignity of manual labor. Even Brahmin students are weaned from their prejudices against hand labor and willingly take part, while in the College, in all farm operations. But, under the circumstances mentioned above, to set oneself up as a farmer means an amount of self-sacrifice and patience to thrive under ridicule to which few men are equal. That some students of the College have taken to agriculture under overwhelming discouragement is a hopeful sign, and shows that the College supplies a want in the Educational system, and that the educational advantages offered by it would be productive of more good than hitherto, especially if some changes are made in the rules and inducements to join the College are held out to students connected with large land-holding families.

The general curriculum of studies should be altered so as to suit the purposes for which the College was established.

The following suggestions are made:—

(1) Arrangements should be made for devoting more time for practical work. The following subjects might be dispensed with:—Mechanics, Mathematics, Mensuration, Building Materials and Forestry.

The remaining subjects can be satisfactorily gone through during the first two years of the course. During this period students should also attend classes for practical instruction on the fields, in the Veterinary Hospital and the Botanical Garden. They should also take part in all farm operations.

Two years' theoretical instruction would be quite sufficient, especially as students would come to the College, in future, after having had some preliminary training in District Schools, in case the suggestions to be made in subsequent pages for starting farming classes in connection with these schools are approved of.

During the third year of the course, students should be required to cultivate small fields assigned to them under the supervision of a member of the staff.

(2) Members of the staff should be allowed to make frequent tours at Government expense.

(3) Rules for the disposal of waste land should be altered in favor of the students. Two cases have occurred within the last three months in which applications for such land were made by students without success.

(4) Facilities should be afforded to students for obtaining large loans under the Land Improvement Act.

(5) Students taking up such land should be exempted from the payment of assessment for some years.

(6) Assessment should not be levied on fodder crops and crops grown for green-manuring the land.

(7) Admission into the Senior department should be restricted to those who have passed at least the Matriculation Examination. This rule might be relaxed in the case of paying students holding sufficient land.

(8) At least two scholarships or fellowships of Rs. 500 a year each should be established. These scholarships should be tenable for three years and awarded to students who pass the examinations with credit, provided they take up farming as their calling or make satisfactory arrangements for starting a school having a farm of sufficient size attached to it to impart combined agricultural and general instruction. In either case reports on their work and its results should be submitted during the first five years. A student holding such a scholarship might be allowed, during the first year, to make a tour through any districts of the Presidency so as to acquire a knowledge of the local conditions so very essential to his success.

(9) A special Agricultural Degree should be established and thus Agriculture placed on the same footing as Medicine and Engineering, or a certain value should be assigned to the Agricultural Certificate and Diploma. At present a Matriculate with the Diploma ranks as a Matriculate still.

(10) In case the institution of a Degree in Agriculture is considered premature, an Associateship should be conferred on a student two years after completing his course if satisfactory evidence is afforded that during these two years he was engaged in farming or in acquiring agricultural knowledge and experience. The Associateship should carry certain privileges as, for instance, eligibility to be elected a member of a Local Fund Board.

(11) One Tahsildar, one Deputy Tahsildar, and at least three Revenue Inspectors in each district should be students of the College who have passed through the Senior course and possess other prescribed qualifications. This concession is asked for not to create openings in the Government service for students of the College but in order that these men, thoroughly impressed with the importance of agriculture, may by means of their official position and the influence they would wield create a healthy opinion in favor of Agricultural Education. When the tide of popular opinion has turned in favor of Agricultural Education, this rule may, if necessary, be done away with. If this concession is granted, the cause of Agricultural Education would be greatly served and the Revenue Department also would lose nothing, as these men would possess, in addition to the ordinary qualifications for such posts, agricultural knowledge so essential in those entrusted with the charge of vast agricultural interests.

12. Students of the College should be preferred to others as Managers of Estates under the Court of Wards.

(*e*), (*f*), (*g*), (*h*) The present system of education is calculated to estrange farmers' sons from agriculture. It is altogether one-sided. In these institutions young men become wedded to prejudices which, in most cases, continue through life. At the time when tastes and habits are formed, young men now receive instruction which creates in them false hopes and strong prejudice against hand-labor.

It would be a great boon, therefore, if as many schools as possible in the country are made to convey combined agricultural and literary instruction. There should be a small farm attached at least to one of the principal schools in each district so that the pupils may become familiar with the most approved farming processes. A student who has passed through the Senior course of the College should be attached to the school as Agricultural Instructor and Farm Manager. The school with the attached farm should be the centre for the collection and systematization of information pertaining to the agriculture of the district and for the trial of reforms that might suggest themselves and thus be made to grow into a useful institution for instructing people in better modes of husbandry. The farm should be worked as early as possible as a model farm, although experiments cannot be excluded in the very beginning, as the facts which a model farm is to hold up for attention have yet to be discovered. The results of all successful experiments should be published in the District Gazette for the information of the people. Agriculture should be made a compulsory subject for the Middle School and at least an optional subject for the Matriculation Examination.

Sons of farmers and of those connected with land must be encouraged to learn agriculture and to take part in all operations on the farm. Instruction in agriculture should cost nothing extra to the parents. A pupil in the class who takes the first place in agriculture at the Middle School Examination might be awarded a free scholarship tenable for two years on condition of his taking agriculture as a subject for the Matriculation Examination.

Agricultural Education in private Middle and High schools can be stimulated by grants.

The headmaster of every district Normal school or an assistant attached to it should be qualified to teach agriculture. There should be a small piece of ground attached to the school, and young men who are to go out as teachers in village primary schools should receive instruction in agriculture of a practical character. They should be familiar with the ordinary implements and operations of husbandry, the preparation of good farm-yard manure, the preservation of seed, the principles of breeding, management of stock, the good points of animals and the determination of their age, and the segregation of sick animals during the prevalence of contagious diseases. The piece of land attached may be worked almost entirely by the students in training and the pupils of the school. These students should be induced by award of results-grants to impart instruction in the rudiments of agriculture to their pupils in Primary Schools. A piece of garden ground should be attached to each village Primary School where the pupils should work and raise vegetables, &c., under the directions of their teacher.

To obtain men combining knowledge of agriculture with literary qualifications, students in training in the Teachers' College should be made to attend the Junior course of lectures on Agriculture and Veterinary at the College of Agriculture; or, better still, if the Junior Department is reorganized, these students should undergo the full ten months' course after undergoing Normal training. The instruction in agriculture they receive at present is quite insufficient to enable them to become useful agricultural instructors in district Normal Schools and Middle Schools.

The instruction in the College of Agriculture should thus be made available not only to those who are to be occupied in farming for themselves or in managing the estates of others, but also to schoolmasters who are important agents for the dissemination of useful knowledge. If the extended establishment of agricultural schools in the manner recommended be approved of, young men who have shown a decided taste for agriculture may be obtained from High schools to be further trained in the Saidápet College. Such students should have preferential claim to scholarships which the College of Agriculture annually offers.

(*i*) Good text-books on agriculture suited for use in the schools of this Presidency cannot be written now. The information necessary for rendering such text-books really valuable has yet to be collected and arranged. Books in English and the Vernacular languages explaining the general principles of agriculture might, of course, be written. But a text-book intended for use in Middle and High schools of a district would be far more useful if it dealt with the seasons and soils of that district, the crops raised and breeds of cattle found therein, the management of crops and stock in vogue, the defects in the existing system and suggestions for improvement based on successful experiments. Implements suited for use in the district, manures available and the mode of applying them, insects injurious to crops, &c., must also be treated of. A text-book intended to be read in Primary Schools should contain easy lessons in the Vernacular on the seasons, farm-crops and animals, vegetables, fruits, implements, tools, birds and insects. This book may take the place of the reading book in the school. It need hardly be said that a beginning has yet to be made to collect all this varied information, the possession of which alone would enable one to write a thoroughly practical and useful book. Unless men possessing the requisite knowledge and special aptitude for the work are employed to gather the information required, such text-books will never be written.

For the present we should be content with text-books explaining the general principles of the science and containing a description of implements and tools, with hints for improvement suggested by the experience gained on the Saidápet Farm.

SAIDAPET,
11th February 1889.

(Signed) W. KEESS.
(„) G. KRISHNA PRABHU.
(„) S. L. D'SILVA.
(„) C. KRISHNA MENON.

APPENDIX L.

MEMORANDUM ON THE COLLEGE OF AGRICULTURE,

By W. KEESS, Esq., M.A., M.R.A.C., Acting Principal, College of Agriculture.

Before proceeding to lay before the Committee my proposals as to the College of Agriculture, I would like to shortly sketch the manner in which, what I consider, serious defects have come into existence. When Government in 1886 introduced the Technical Scheme or Higher Examination in Science, Arts, &c., a great many gentlemen were employed in order to draw up syllabuses in the different subjects in which it was proposed to hold examinations. These syllabuses were drawn up for the whole Presidency without any reference to the requirements of an Agricultural College. A certain number of these syllabuses were ordered to be introduced into this College either in full or in a mutilated form, the mutilation taking the shape of brackets, all matter within brackets being omitted at the College lectures and at the examinations for the Agriculturist's Diploma. In this way two serious defects have arisen, *first*, a number of subjects have been introduced into the College course which should have been, in my opinion, omitted. As far as I can see the subjects, to which I refer, either have no connection with Agricultural science or their connection is so remote that it is not worth while expending on them time which could be better employed. *Secondly*, in many subjects the syllabuses are improper ones. They were drawn up without reference to agricultural instruction and no number of brackets will adapt them.

2. Simultaneously with the introduction of the Higher Examination syllabuses the College was split up into two departments, one a *Senior* Department with a 3-years' course and the other a *Junior* Department with a 10-months' course. To attract students 13 stipends of the magnificent value of Rs. 7-10-0 per mensem tenable for 10 months were annually offered. At present there are only 9 students in the Junior Department, all with stipends, for no one will apparently come to the Junior Department except paid to do so and unless some artificial value is given to the 10-months' course; as it stands at present, I am sure this will be the case in future years. The reason of the unpopularity of the Junior Department is not hard to discover. The Junior course is simply the first year's course of the Senior Department and is a Junior course in *name* only. There is no difference between the examinations which the so-called Junior students go up for at the end of their course and those which the Senior students go up for at the end of their first year. The public don't seem to attach any value to this 10-months' course. The Agricultural syllabus has had to be cast so as to give some sort of full course on Agriculture to those leaving at the end of their first year. The Senior Department therefore suffers from the presence of the Junior Department, whilst the Junior Department students, owing to their course being an incomplete one, derive very little real good from their training. The third defect therefore to which I desire to invite the attention of the Committee is the present constitution of the Junior Department.

3. The fourth defect is that this, a special College—in fact the only institution of any sort in the Presidency where certain subjects are taught—has its staff arranged as if it were a general College. There are five Assistants, of whom four are Special Assistants and one (Surveying) who would not be so classed at an Agricultural College. Among the four Special Assistants there have been four changes within the last 12 months; one of the changes was made in the interests of the College (viz., the sending of an Assistant to the Bombay Veterinary College to qualify for the Bombay Veterinary Diploma). When a Special Assistant leaves, as this is the only institution where certain subjects are attempted, it is very difficult to replace him, and consequently every change in the staff is a distinct loss, which should be avoided if possible. Besides, when the Teachers' College is removed from the upper story of this College, an Agricultural Museum should be fitted up. This is the work of specialists and with constant change of workers can never succeed. The fourth defect therefore is the frequent change of staff.

4. At Saidápet there is a farm of 30 acres (arable and pasture), chiefly composed of the worst soil it is possible to imagine. It is bounded on two sides by the river Adyar, on a third side by Saidápet and the remaining side by land which is occupied by other departments. The College Farm is apparently fixed in area. There is hardly sufficient land for class purposes and nothing can be spared for independent cultivation by students. The men therefore go out from here without the confidence in themselves which they should possess. This is a most serious defect which should be remedied if possible.

5. I shall now proceed to propose remedies for these defects. The remedy for the first defect is the complete withdrawal of those subjects which have no direct connection with agriculture. I would urge that the following subjects should be removed from the College course, viz. :—

1. Mathematics.
2. Mensuration.
3. Building Materials and Construction.
4. Forestry.
5. Statics, Kinetics, &c.

As to *Mathematics* (1) and *Mensuration* (2), I fail to see why Agricultural students should spend their time over general subjects of this sort. More than one quarter of the whole time devoted to indoor study during the first year is devoted to these subjects. Of what possible use can the "theory of parallels" and the "area of the surface of a frustum of a cone" be to an agriculturist? These subjects take up time which could be better employed, and I strongly urge their withdrawal.

Building Materials and Construction (3).—The subject is of such a nature that it would hardly be of any practical use to a student in after-life either as an agriculturist or as a Government servant in such departments as are likely to be resorted to by men from this College.

Forestry (4).—This can only be useful to a student who is eventually to serve in the Forest Department. Besides there are no facilities for teaching the subject at Saidápet.

Statics, Kinetics, &c. (5).—The amount of statics required for an agriculturist is not much. All he wants to know is that small portion of statics which would help him to understand implements, water-lifts, &c. The syllabus prescribed is a most formidable one and entails a knowledge of Mathematics, such as very few of our students are likely to possess.

6. To remedy defect No. 2, nothing but a thorough recasting of the syllabuses will be of any avail. It might be said these syllabuses could be adapted by brackets and notes, but so long as the fiat remains in force that the main body of the syllabus, as first drawn up, should not be touched, these endeavours at adaptation will be unsuccessful. Unless the Committee are prepared to recommend a thorough revision of the syllabuses by specialists with a view to adapting them to the needs of this College, I beg that the present syllabuses be untouched, for I fear that half measures will make "confusion worse confounded."

7. I now proceed to state the alterations I would recommend in the syllabuses.

(*a*) *Agriculture.*—If the Junior Department is to be maintained in its form, I would urge that the two Agricultural syllabuses (Preliminary and Advanced) be left untouched, for these syllabuses were specially drawn up by Mr. Benson and myself to suit both Departments under present circumstances. But if the Junior Department is to have a separate course of studies, as recommended later on in this memorandum, I would have the present Preliminary syllabus for the Junior Department and a new Advanced syllabus for the Senior Department; this syllabus to be divided into two parts, one to be done during the first year and the other during the second.

(*b*) and (*c*) *Veterinary Science and Animal Physiology.*—These syllabuses are the worst in the College. Veterinary science should be divided into—

(1) Veterinary Anatomy,
(2) Do. Physiology,
(3) Do. Surgery and Medicine, with Materia Medica;

all these being dealt with with special reference to cattle and sheep and not to horses and human beings.

(*d*) *Botany.*—This syllabus should be recast and special stress laid on Botanical matters connected with agriculture.

(*e*) and (*f*) *Chemistry, Inorganic, Preliminary and Advanced.*—The Preliminary syllabus is too elementary and the Advanced contains too much. As a matter of fact nine-tenths of the Advanced syllabus is in brackets. I would recommend that certain portions of the Advanced syllabus be added to the Preliminary syllabus; that the practical work prescribed for the Agriculturist's Diploma in Advanced Chemistry be also added to the Preliminary syllabus; and that the whole should form a new Preliminary syllabus. In that case the Advanced Chemistry could be withdrawn altogether as far as this College is concerned.

(*g*) *Organic Chemistry.*—I would recommend that this syllabus be retained in its present form with the brackets as they now stand.

8. In paragraph 4, I have drawn attention to the limited extent of the farm. My object in doing so was to urge the institution of an out-Farm, say of 150 acres in extent, in connection with the College. If all my proposals regarding the Senior course are accepted, all their lectures, with such practical instruction as it is possible to give at Saidápet, will be finished in *two* years. During the third year the men should be located on the out-Farm. Here each man should have a plot of, say, 3 acres to cultivate by himself more or less experimentally. Besides which there should be a portion, say of 50 acres, which should be cultivated as a whole by the students. I would recommend the soil to be better than that at Saidápet, so as not to discourage the men. If within

5 miles of Saidápet by road or 1 hour by train, the out-Farm could be supervised by the College staff. It would want a Manager and Bailiff, but its produce would pay for the working. I think this suggestion *most* important and I would strongly recommend it to the favorable notice of the Committee.

9. The course of studies I would therefore recommend for the Senior Department would be as follows:—

First Year.

1. Agriculture (Advanced, Part I).
2. Veterinary Anatomy.
3. Do. Physiology.
4. Inorganic Chemistry(*new* Preliminary syllabus).
5. Botany.
6. Physiography.

Second Year.

1. Agriculture (Advanced, Part II).
2. Veterinary Surgery and Medicine.
3. Organic Chemistry.
4. Economic Entomology.
5. Surveying and Levelling.

Third Year.

Engaged in Agriculture on the out-Farm.

A student who has obtained say 35 per cent. of the maximum marks and 50 per cent. on the total and who has worked properly on the out-Farm might be given a Diploma. In the examinations more stress should be laid on the practical side, and it should count as high or almost as high as the paper work. Time given to the practical examinations should be a *great* deal longer than at present.

10. I shall now proceed to deal with the Junior Department. I have already shown that its course is a Junior one in name only, being in reality the first year's course of the Senior Department. I strongly urge that the Junior Department should be entirely reorganized with a view to making it a Junior Department in reality. By this I mean that the course of studies should be arranged with a view to meet the requirements of men who are only to stay at the College for 10 months. The course of studies I would recommend would be as follows:—

1. Agriculture (present Preliminary syllabus).
2. Chemistry (Elementary).
3. Botany (do.)
4. Veterinary (do.)
5. Animal Physiology (Elementary).

The last four mentioned subjects should have separate syllabuses drawn up, having in view the fact that the course is one of 10 months only. The present Preliminary syllabus in Agriculture would do for the Junior Department.

11. In paragraph 3 I have drawn attention to the frequent changes in the staff. The cause of this is easy to explain. The salaries of the Special Assistants (with the exception of the 1st Assistant, who gets 200—10—300) are not high enough to tempt a good man to stay. In fact, since I have joined the College I have felt that all the Assistants with the exception of the Senior Assistant look for speedy promotion outside of this College and regard their work at this institution as only of a temporary nature. I would strongly urge that the salaries of the three Special Assistants (Agriculture, Veterinary and Science) be fixed at 200 rising by ten annual increments to 300 rupees. I would also urge that every Special Assistant should be considered on probation for one year and, if approved of, should be bound down to serve at least 5 years, during which time he should undertake to abstain from seeking employment elsewhere and to devote his whole time to his duties. It might possibly be asked why the Agricultural College should be treated differently from other Colleges. The answer I give is that in case a post falls vacant in any general College and in most other special Colleges, the choice of a successor is an easy matter, for a great many men who have been tried elsewhere are available. But should a lecturer leave this College, which is the only one of its kind in India and which only 9 years ago turned out its first batch of students, no tried men are available and the eligible untried men are very small in number. The salary I propose would secure the best of the younger untried men. The year's probation would enable it to be seen whether the man chosen would develop into a specialist or not. And the binding down for 5 years would enable the College to retain his services for that period. To bind an Assistant down on a small salary would doubtless be a great hardship and would tend to keep good men away; to stop an Assistant's promotion, when he is drawing a small salary, on the ground that the College cannot spare his services, is not what one would like to recommend. I have made enquiries and I find 200—10—300 to be the salary which would allow such conditions as I propose to be insisted upon without either keeping good men away or inflicting hardship on those already at the College.

12. From G.O., dated 25th October 1888, No. 605, Educational, which was communicated to the Committee, it will be seen that it is proposed to pension Mr. Robertson at his own request, to abolish the post of Vice-Principal and to reduce the Principal's salary to 500—50—1,000. If this is done, the salaries of the three Special Assistants could be fixed at the sum proposed by me; the College could be provided with two other Assistants, one for Surveying, &c., and one for the Junior Department on salaries of 75—5—100, and yet an annual saving of Rs. 6,108 effected. In the subjoined statement the salaries of the present and proposed staff are given with averages calculated according to the Civil Account Code:—

Present Staff.

	Minimum.	Maximum.	Average
	RS.	RS.	RS.
Principal	800	1,000	933
Vice-Principal	500	750	667
1st Assistant	200	300	275
2nd do.	150	200	187
3rd do.	100	150	137
4th do.	100	150	137
5th do.	75	100	94
Total ..	1,925	2,650	2,430

Proposed Staff.

Principal	500	1,000	833
Special Agricultural Assistant	200	300	275
Do. Veterinary do.	200	300	275
Do. Science do.	200	300	275
Assistant for Surveying, &c.	75	100	94
Do. for Juniors	75	100	94
Total ..	1,250	2,100	1,846

That is, a saving of Rs. 7,008 per annum.

13. Mr. Grigg apparently thinks an European Veterinary Surgeon necessary for developing the Veterinary branch of the institution. If it is intended to only train men as agriculturists, I certainly do not agree with Mr. Grigg and have told him so, as I think a good native Special Assistant could do the work. But if this College is going to train men for the Veterinary Diploma, which is the same as training them for the Cattle Disease Department, I am of opinion that it would possibly be better to have an European Veterinary Surgeon permanently associated with the staff. In the latter case I would have only two native special assistants, one for Agriculture and Science on 250—10—300 and one for Veterinary on 200—10—250. Besides these two others on 75—5—100 would be necessary. The staff could then be arranged as follows:—

	Minimum.	Maximum.	Average.
	RS.	RS.	RS.
Principal	500	1,000	833
Vice-Principal	400	600	533
Special Assistant for Agriculture and Science ..	250	300	287
Do. do. for Veterinary	200	250	237
Assistant	75	100	94
Do.	75	100	94
Total ..	1,500	2,350	2,078

That is, a saving of Rs. 4,224 per annum.

14. Having dealt with the staff it would perhaps be as well to continue with the financial aspect of affairs. As to stipends, I consider them necessary at this stage of the progress of agricultural education. At the same time some definite rules should be laid down as to their choice, so as to obtain the right sort of men.

There are 22 Collectorates. I would give each Collector a nomination every other year to the Senior Department. The Senior stipends being of the same value as the present ones would cost Rs. 4,620 or, roughly, Rs. 4,700. I would also give every Collector a nomination to the Junior Department every other year. These stipends should, I think, be of the value of Rs. 10 monthly tenable for 10 months. Total cost Rs. 1,100. I would abolish Muhammadan stipends. It is very rare that a Muhammadan wants to come here, and when he does, there is no outlet for him except

the subordinate ranks of the Government service. Total cost for stipends Rs. 5,800. The total cost of College and Veterinary Hospital would therefore be—

	RS.
Staff (average)	22,152
Stipends	5,800
Travelling allowances	1,000
Bailiff, clerks, servants	2,500
Farm	3,150
Botanical Gardens and Grounds	850
Veterinary Hospital (establishment and charges)	1,600
Laboratory and Museum	1,000
Contingencies	800
Up-keep of buildings, taxes and special contingencies	1,148
Total ..	40,000

For the first five years the charges would be much less, as the majority of the staff would be drawing much below the averages stated.

In 1887-88 Government sanctioned 45,000 rupees for the College and 2,500 for the Veterinary Hospital; total Rs. 47,500. The figures given as the estimated cost therefore show a saving of Rs. 7,500 per annum.

15. I have omitted the out-Farm, which would annually cost about 2,500 rupees for establishment (Manager 70 per mensem; Bailiff 30 per mensem, &c.), and charges should cover the expenses.

SAIDAPET,
11th February 1889.

(Signed) W. KEESS,
Ag. Principal, College of Agriculture.

APPENDIX M.

ORAL EXAMINATION

OF W. KEESS, ESQ., M.A., M.R.A.C., AG. PRINCIPAL, MADRAS COLLEGE OF AGRICULTURE.

1st April 1889.—*On the joint reply.*

(*a*) 156 students are Brahmins: whether this is a healthy sign as regards agriculture, I am not prepared to answer. It is as probable that a Brahmin would engage in agriculture as a Sudra; every Brahmin is a landholder as far as I know; and their presence in excess would show that the intellectual classes were very well represented.

(*d*) (1) I don't think there has been time to produce any effect on the agricultural practice of the country by means of the College; the first batch of graduates only went out 9 years ago. Perseverance and continuance in effort are necessary to achieve success. Many of the men have got sufficient knowledge to demonstrate their knowledge. By demonstration, I mean demonstration by taking up a piece of land and actually showing the results to the ryots. Hitherto the demonstration of successful experiment has been too circumscribed: I do not think that even at Saidápet there has been any improvement amongst surrounding ryots. I believe that if men went *alongside* of the ryot and cultivated without making any fuss, there would be success. Saidápet was never worked to impress the ryot; it was really an educational farm; the dissimilar nature of the cultivation and practices militated against its success as an example.

The pursuits of some of the men who have passed out of the College would tend to have an influence on agriculture; *e.g.*, the Bombay importer of improved implements who does a very large business; Massey and Co. employ a "demonstrator of agricultural implements." Graduates as Revenue Inspectors might conduct agricultural experiments on a very small scale by supervising the conduct of them when at their head-quarters. Sami Iyengar and Krishna Kurup are certainly engaged in developing the resources of their private property.

Under the old rules, Government promised through Collectors that students should be provided with employment as soon as they passed; hence my allegation to that effect.

As regards the allegation that agriculture is considered a menial occupation, I believe from what I have seen of students of other Colleges outside of Saidápet, such as the Teachers' College, that to take any part in the direct supervision of their lands would be considered a degradation in status. Agricultural students do not seem to be deterred by this consideration. Compulsory agricultural education up to the Junior course would have the effect of removing this idea on the part of the alumni of the Teachers' College. As compared with Government service, I believe that some Saidápet graduates are deterred from entering on agricultural occupation.

I don't think that the B.A. class of men would be suitable as an agricultural student; he would never be likely to take to an agricultural occupation. A few F.A's might have a good effect, but the best students that I have turned out are men of inferior actual attainments, though they might have got a good Degree if they had been able to go on. It would be a great mistake to restrict students to F.A's, or even to Matriculates.

There is no doubt that Saidápet graduates have to pass through a large amount of ridicule. If an Agricultural Test were recognized for Government service, it would have a marked effect in improving the prestige of the education. A certain proportion of Government servants should certainly be agriculturists. I think that Revenue Inspectors should, after a certain date, be only appointed from agriculturally-trained men. I would require only a knowledge of agriculture proper. I should say that a Revenue Inspector's duties would be the better performed for such a knowledge, but I am not fully acquainted with the details of a Revenue Inspector's work.

I proposed to alter the durkhast rules in favor of graduates of the College, because I know of cases in which graduates were kept out as strangers; I think there is a good deal of trickery in such cases.

Loans to graduates would enable them to start farms. I think that, if men were properly selected, there would be no great chance of eventual loss to Government if they were provided with land and advances to work it as is being done by the Travancore Government. They might be selected from the knowledge gained of them in their three years' course. I cannot say what amount per acre would be necessary for stocking and working a farm.

They should be relieved from assessment, because the effect of their example would be so great if successful; if not successful, of course the ryots would go on in their old way.

As regards non-assessment on fodder crops, I referred, I believe, to the case of these students, and not to general practice.

Ryots are clever enough in noting results to make allowances for the advantage of non-assessment, and this would not bar their accepting the results if successful. Practically, the matter would be an experiment conducted at Government cost.

A man so farming would have to keep regular registers and accounts. I would not tie him down to particular crops, but would leave him to work on his own system, only under supervision. He would have to repay the advances of Government.

The Tahsildars, &c., whom I recommend for appointment from among these graduates would not be exempted from the ordinary Tests.

Court of Wards' Estate Managers would be more fitted for Managers if graduates of the College than if they were not: they might not be able to introduce changes in practice, but they are in intimate contact with the people and would have considerable influence; of course, other qualifications would be necessary. For a big estate, a man like Mr. C. K. Subba Row would be suitable. If there were two men of fairly equal claims, I would certainly prefer the agricultural man. I would not choose a man, simply because he was an agriculturist.

I certainly believe in model farms as excellent methods of educating the ryot. By "model farms" I mean farms where successful experiments should be demonstrated to the ryot. I do not see how it is possible to bring the results of successful experiments to the ryot without such demonstration. I don't think it is possible for ordinary educational methods to bring results to the knowledge of the ryot: he will not believe in mere assertions or lectures.

(*i*) If the right men were set to work, good text-books could very soon be prepared. Text-books are an evil in teaching a practical art such as agriculture if the teacher merely teaches the text-book. I certainly cannot accept the general proposition that they are an evil if there is proper teaching. I don't consider it practicable to introduce the teaching of agriculture in any schools without text-books. I consider that if the teacher is a good man, he *could* supply the place of a text-book, but it would be a difficult matter and hardly probable. I don't think that there is a sufficient accumulation of accurate knowledge to enable a text-book for a specific district to be written.

Individual Memorandum.

(4) and (8) Practical training is insufficient, because of the small area of the farm, viz., 30 acres. The difficulty as to the want of individual attention owing to the size of the classes could be got over if the farms were extended; in the old days, there was no real attempt to train the men practically; they had three years' lectures, whereas I propose two years' lectures and one year's practical work.

I don't say that the men as now trained are useless, but they are not so trained as to have sufficient self-confidence.

I would prefer not to take up any part of the old farm, but would have an independent area. Even at present, they have to go through the whole operations of farming, such as ploughing, sowing, &c. But on very small plots, it is difficult to teach the various methods and practices of a farm. If my proposal is not practicable, I would like about 20 acres more at Saidápet in order to carry out Mr. Grigg's proposals, viz., that the present farm should be supplemented by a similar area for two purposes, one being lecture demonstration and the other the cultivation by students on a much smaller scale than I propose. I consider that what I have proposed is the best plan I know; if not, Mr. Grigg's proposal should be tried. I don't think there has been success in practical work as there have been no proper arrangements or area for them. Mr. Grigg's proposal would certainly be an improvement on present practice. I don't know of a third course, and if my own plan is not feasible, Mr. Grigg's seems the only other plan. It could be so arranged that in a 3-years' course this system could be carried out.

In carrying out Mr. Grigg's proposals, I would give students who showed aptitude for it, small plots for their own individual cultivation; there should also be compulsory work on the class-system as at present.

Students might be granted a premium from the profits of their cultivation; a material share would have a good stimulating effect. They should not be allowed to hire labor.

No increase to the water-supply of the Farm which we could not ourselves carry out would be needed under Mr. Grigg's proposals.

Para. (1).—I assumed as it was not specifically stated that the syllabuses were specially drawn up for an Agricultural College, that they were not so drawn; I was not then in the country. My remark does not refer merely to the Agricultural syllabus, but to all the syllabuses. I am aware that Mr. Robertson was almost fully responsible for the Agricultural syllabus. In regard to Chemistry, I am not aware that the bracketing of the syllabus was carried out in accordance with Mr. Robertson's wishes and suggestions. I am not aware that he had a potential voice in the bracketing of the syllabuses in the other branches. From what I have heard from Mr. Benson in conversation, I understood that he had very little to do with drawing up the several syllabuses. I am not aware that Mr. Robertson ever made any demand for separate syllabuses. I do not know officially that Mr. Robertson disapproved of them. In saying that the syllabuses appear to be drawn up without any reference to the requirements of an Agricultural College, I mean that they appeared to be drawn up rather with the view of a general examination scheme than for the special requirements of such a College.

I am aware that the Committee had the College in view in drawing up the syllabuses, but I am not aware that the College requirements were specially considered in drawing up the rule for the Science Examinations.

I am not aware that Mr. Robertson wanted separate syllabuses for his College, *e g.*, in Chemistry.

I should prefer a syllabus which should refer specially to our College requirements, as our institution is the only one of its class: I would not have brackets: I would remove all brackets and remodel the syllabus. I do not require a *separate* syllabus for the College, but such a syllabus that it could be used in the College and outside of it without brackets. The College standard should be such that it would be similar to that obtaining outside the College, and the syllabus should be modified to suit this standard. I believe that in Chemistry, for example, it would be quite possible to have a syllabus which would serve the Medical College as well as the Agricultural College.

All agricultural students should pass a Veterinary course. The Preliminary syllabuses for Agriculturists and Veterinarians should be similar, but the latter should have a subsequent Advanced Veterinary course. Instead of Veterinary syllabuses, there might be a system of stages. I don't know of any obstacle to giving effect to this arrangement if the other science men agree.

As regards the number of subjects introduced for the course, I presume it was in accordance with the views of the then Principal, Mr. Robertson.

I was a member of the Sub-Committee which met to revise the syllabuses: I understood at the time that, with the exception of the Agricultural syllabus, it was merely intended to rebracket and not to propose new syllabuses. Agricultural Chemistry had to be modified.

As far as I can see, there was a serious difference between the subjects as taught when Mr. Robertson was in charge and those taught under the Technical Examination scheme. There are many extra subjects in the Technical Examination scheme.

In both.	*In Technical Examination scheme.*
Agriculture.	Pure Mathematics and Statics.
Botany.	Physiography.
Chemistry.	Engineering Matters and Building.
Zoology.	Forestry.
Veterinary Art.	
Book-keeping.	
Land Survey and Mensuration.	
Drawing.	

I think the addition of the Technical Examination subjects has been a material addition to the course, which still remains only a 3-year course. I believe Mr. Benson thinks Mathematics necessary; he also thinks, as I do, that a *moderate* amount of Kinetics and Statics is necessary.

Professor Wallace, I see by the book now placed before me, did not object to the number of subjects, but only to the standard and quantity of parts of the syllabuses. It was subsequent to that visit of Professor Wallace that a Committee met at the Public Instruction office and revised the syllabuses. Geology, Pure Mathematics, 2nd stage, and Hydraulic Engineering were cut out; these changes accorded with my views; at that time I wanted the body of various syllabuses to be changed, but it was said not to be then advisable as several gentlemen who had helped to draw them up were not in India. The method of dividing a subject into stages and thus getting rid of the difficulty as to standards did not then occur to me except in the case of Economic Entomology. It was as it were a surprise, Committee and I understood that we were only to discuss modifications and the recasting of the syllabuses.

Veterinary Science and Animal Physiology are the subjects I had specially in mind when I stated that the syllabuses were drawn up evidently with a view to a general examination scheme and not for the special College purposes. I knew that Mr. Mills and Mr. Robertson had a great share in drawing up the above syllabuses.

As regards Animal Physiology, I have no doubt that the Sub-Committee which drew it up comprised the best men available; I only wish to say that I know of no instructions which show that the syllabuses were to be drawn up other than for the general scheme.

I know that Dr. McNally, who helped in the Physiology syllabus, was then the Chemical Lecturer at the College.

I consider that 16 compulsory subjects in a 3 years' course are too many, even though all subjects may be considered as having a bearing on agriculture either nearly or remotely. I would strike out some as compulsory and make others optional. I would also give room for a certain bifurcation of studies with a view to the future career of the student.

An F.A. would doubtless pass the course much sooner than a Matriculate: perhaps in two years; not one-tenth of the students are or have been F.A's.

The object of the Junior course is to provide for men who don't require or can't afford the Diploma, but only a lower standard of agricultural education. I am not aware that it was specially intended for Revenue Inspectors or any special class of men. The reason for its not being taken advantage of is that men don't think it will lead to anything, as it is not a Diploma course; moreover the stipend is insufficient. I don't think that its unpopularity is due to its

giving students an inferior status as regards others in the same College. The entrance qualification for both courses is the same; men are sometimes allowed to go on from the Junior to the Senior course as the first year for both is practically the same.

The special object of the recasting of the syllabus in Agriculture was to provide a distinct and complete Junior course. We teach both sets of men together, because as they go up for the same examination, we have to go over the same words in each case. It is strictly correct to say that both sets of men have to go through the same course for the first year; as I read the rules, it is compulsory for Senior course men to appear for the preliminary examination. I am not aware of the exact meaning of the words italicised in marginally-noted extract from the U.C.S. Examination rules. I did not know that this referred to the Saidápet College. Moreover, I certainly think that it is a good rule for an external test to be applied to students even of the Senior course to see how they are getting on.

"Every candidate for the advanced Higher Examination in any subject must have passed either the Preliminary Examination—*or have completed in a technical institution a course of study accepted by the Commissioner as equivalent.*"

There is a provision in most of the new syllabuses for the students of the Senior course proceeding in an advanced manner with the subjects of the preliminary course. In the first year they study with the Junior course; the advance is made in the second and subsequent year. No doubt they ought to be taught separately, viz., by separate syllabuses. Staff and room have been insufficient for separate classes. I have proposed a new staff and consider that it would be sufficient for separate courses, provided that certain subjects be left out as I have proposed.

The Senior Department suffers from the presence of the Junior Department, because the preliminary syllabus is drawn to suit the Junior Department, so as to give them a complete course; that is not a satisfactory course for men of the Senior Department. The Junior course would be sufficient as the special course to be passed by men trained in the Teachers' College so that they might teach agriculture in the Middle or Rural schools. The hardship is upon the Senior, not upon the Junior students: it was drawn to give a complete elementary knowledge over a whole range of subjects, whereas I would prefer to teach Senior course men more thoroughly in certain subjects so as to prepare them for the remainder of their course.

If the staff were thrown into a graded service composed of the staff of all the Colleges, my objections as stated in paragraph 3 would, to a great extent, be removed.

The four changes mentioned in paragraph 3 were, with the one exception noted, caused by men seeking promotion or better pay outside the College.

I know the system of Probationary Assistants in the Teachers' College, viz., that the best students are selected and kept for 2 years. Such a plan might succeed at the Agricultural College if an opening were provided for the men as is practically the case at the Teachers' College, *e.g.*, if Agricultural Classes were opened at up-country schools, &c.

Paragraph 5.—As to the removal of Mathematics and Mensuration from the course, I would say that we must accept the men as they come since the Agricultural College is not the place to remedy the defects, if any, in general teaching. I think that a First-class Middle-school boy is sufficiently advanced in Mathematics for all purposes of the Agricultural College for the course I suggest, not for the present course which includes Statics, &c.

I do not think that Mensuration should be a compulsory subject in Agriculture, simply because it is desirable for Government service. For general agricultural education I think it is unnecessary and not essential. Mathematics are not taught at Cirencester, but Mensuration is taught in connection with surveying. It should be left optional. I would leave surveying and levelling as they are and the lecturer could teach such portions of Mensuration as he might think necessary.

As regards Building Materials and Construction, I adhere to my opinion that it should be excluded from the syllabus. It is taught at Cirencester, for the men there are to become land agents, &c. I think that in the present conditions of the country it is unnecessary to include this subject; of course it is *possible* that in some cases such knowledge might become useful, but not ordinarily.

If the course were kept at 3 years, I would leave out the subjects I object to for the compulsory course, as it is useless to teach subjects merely to fill up time.

Most of Statics and Kinetics are bracketed out for the purposes of the College. My chief reason for objecting to this subject is the nature of the paper set at the last examination. To satisfy the requirements of the College, it would be easy to prepare a simple elementary course in Kinetics, Mathematics, &c.

My object in devoting the third year to practical work is to insure that every student shall have had actual farm work; at present there are no existing reliable farms on which he could work as is always the case in other countries. I don't see why we should not try to turn out practical farmers, and not mere theoretically taught men. Any person then wanting to employ them could be sure that they had passed a practical course. I believe that 1 year would be sufficient to put a man through all necessary practical work; it is not merely 1 year, but 1 year *plus* a certain amount of practical work through the preceding 2 years.

At present I believe the object is rather to turn out men who would be useful in Government service than practical farmers.

I consider that in 2 years one could get through as much work and reach as high a standard in the subjects which I would teach, as in 3 years if the subjects I object to, are retained.

In the third year, the students would attend to Agriculture solely and not to Veterinary Surgery, &c.; the practical knowledge obtained would be worth the scholarship given; a student could not do much better work if he really worked his own farm area. It is the condition of the farm area by which he would be judged. Each man would have his own farm and work it on his own idea, with his own labor; even if a rich student put extra capital, manure, &c., on his own land, it would go into his accounts and this would be allowed for in noting results. I consider that every man should have an actual personal knowledge of every farm operation. Exceptional men might possibly take charge of an experimental farm without practical work, but not ordinarily.

I think that the present scheme of examination would have to be very much expanded to allow of the practical side being fully treated.

If the Board of Examiners were fairly permanent, they could probably work out a scheme of practical tests. I don't think it possible to apply the present system of the Engineering College to the Agricultural College, viz., that they shall go out to public workshops or works and go through a practical course under the general supervision of the College authorities: there are no farms to which they could be sent for such purposes. If the men had the third year's practical work which I suggest, I should have far more confidence in their capacity as agriculturists. I don't think that it would be well for the practical work to be done in an intermediate year.

They could be kept up to the collar while at practical work by College supervision and by the knowledge that they were to be examined by an outsider.

During the first two years, they would have in practical work what they now have, viz., about 3 hours per week.

If the theoretical work, reduced as I have proposed, be extended over three years, I should be able to give a great deal more practical work than at present; the scheme Mr. Grigg proposed on Saturday would do, if my own scheme is not accepted.

It would be useful to introduce marks for practical work. There would be no difficulty in incorporating such marks with the marks for the theoretical work. At present the marks for the practical work could not be so high as for theoretical work.

I don't think that, for any practical purpose, the agricultural teaching given to the Teachers' College men is of any use. As preliminary to any agricultural course even, it is not of any practical use; a man gets about 20 lectures in a year and walks about the farm, and that is of no subsequent value. As a matter of fact, the men don't evince any interest in the subject, as it does not affect their future life; none of them has ever gone in for any agricultural course subsequently.

The agricultural graduates would not be capable of teaching agriculture efficiently unless they had also gone through a Normal school training, which might be done in six months, if the extra subjects of the Teachers' College were left out.

I do not think that they should, while undergoing their Normal training, be sent over to the Agricultural College to assist in teaching; they should rather be exercised in the Training school of the Teachers' College.

I consider that the Saidápet farms as worked by the students would pay commercially: the students would do all except the most menial labor: it is my belief from what I have seen that the farms would pay their expenses.

I know of no scientific research that has ever been done by the Agricultural College; there is no opportunity there for research. I don't think that abstruse experiments could at present be conducted. We teach general subjects, and so far as possible what is known of native practices. It is the function of an Experimental Farm, not of a College, to examine native practices and see what is faulty; there is a record of such experiments in the history of the Saidápet Farm. It would be desirable, if possible, to carry on original research at Agricultural Colleges, but I would not at present sacrifice any opportunity for tutorial work to that of research. It is possible even with the present amount of tutorial work for the staff to engage in research, if increased facilities were given; I have perhaps fifteen or eighteen hours tutorial work per week and there are the vacations. I don't see that any change of control would facilitate the opportunities for research; on the other hand, demands from the Agricultural Department for experiments might seriously interfere with tutorial work.

I don't think there are grounds for saying that the Agricultural syllabus would have been more practical if the College had been under the control of the Agricultural Department.

I see no reason for treating Agricultural Education differently from that of Medical or Engineering. I think in fact that a transfer of the College to the Agricultural Department would interfere with College work, as there is evidently a tendency towards setting special work.

On Mr. Benson's evidence.

I would abolish all stipends at the College and would even demand fees, provided the Diploma has a recognized value given to it: stipends are only needed so long as Government does not recognize the Diploma. At present the cost to a paying student is about Rs. 1,000 for the whole 3 years.

If, on the High School Examination scheme, the subjects of the College were recognized as amongst those necessary for Government service, there would be a great increase in the attend-

ance at the College, but it would tend to men taking up simple courses of three subjects rather than the whole course.

If certain posts were reserved by Government for F. A's, they might equally be reserved for men having the Agricultural Diploma, as that is at least of equal value.

Even without stipendiary scholarships, the College would increase under the mere action of the proposed High School Examination scheme if that comes into effect.

I consider the connection of Collectors with the College in the nomination of students to be advantageous, but not absolutely necessary.

I would introduce prize scholarships if stipendiary studentships are done away with. I would prefer scholarships on the results of their College work and during their College course rather than entrance scholarships. Open entrance scholarships for the best men with subsequent scholarships for the men who are best in College would be a very good plan. The present Government grant for stipends might be given in that way.

At present I don't think it would be advisable to add Elementary Agriculture as a subject for the entrance examination, as it would simply be learnt out of books. I would demand general subjects; *e.g.*, Mathematics, which I propose to exclude from the College course. The marks obtained at the University Examinations might be added to those obtained at the College entrance examination to decide the results for scholarships.

There is no necessity to have an apprentice class on the College Farm. I would not supplement the College course by a system of apprentices from among the passed students; there is no hope for such supplemental apprenticeship unless the farm be much increased.

I don't think that Mr. Benson's proposal to accept the work of men for 2 years on an outside farm to be practicable, because there are no farms which we could accept, or where we could say for certain that they had really worked.

It would be well to encourage men who have had previous knowledge of farming work to come to the College; that might be done by giving a preference in the entrance scholarships.

It might be possible, but it does not seem very practicable in the present state of the country to combine in the person of one officer, such as an Inspector, various work such as those of cattle disease inspection, wandering instructions, &c

I differ from Mr. Benson when he says that class text-books cannot be written for particular districts.

I don't agree with Mr. Benson as to the splitting of the Agricultural syllabus, and making Agricultural Chemistry and Geology subsidiary to Chemistry.

Neither should practical agriculture be separated from the ordinary College system and taught separately.

About 10 would be the proper size for a class for practical work. With a separate Junior Department and the subjects excluded as I have recommended, 25 would be about the limit of a College class: that would be 75 Senior in 3 classes, and 25 Junior, or 100 in all; this would give 10 classes for practical work.

For Veterinarians, men should pass through the first year College course, and then go for a year or even two through a special Veterinary course.

The Veterinary side should continue to be a branch of the College, and not a separate institution.

The addition of a dispensary for horses in the neighbourhood of the Madras Stables would be an advantage to the students and would not otherwise present any difficulty. It might be self-supporting; the present out-of-the-way one at Saidápet is nearly so.

I am not sanguine that the original scheme of developing the Forestry branch would be successful: there is no one to teach it, and no possibility of practical forest teaching. Those now in the Forest Department were not trained in Forestry.

APPENDIX N.

REPLIES TO THE INTERROGATORIES OF THE AGRICULTURAL COMMITTEE.

By RAI BAHADUR S. SUBRAMANIA AIYAR, B.L., C.I.E.

Seeds.

(*b*) It is of primary importance that good first-class seeds of ordinary staples should be available for distribution to a limited extent at the head-quarters of the Tahsildar or the Deputy Tahsildar. I believe much less attention is now paid to the use of good seeds than was the case before the famine of 1866. Experienced people tell me that the disastrous famines of 1866 and 1877 have had much to do with this. The want of seasonable rains and also the generally uncertain prospects of agriculture, it is believed, make the ryot pay less attention to the use of good seeds. It is therefore necessary to attract attention to this subject and, if possible, distribute really good seeds. What is called the Kakai or black cholum, which is inferior to white and red cholum, and Kullam kamboo or Pani kamboo which is inferior to Perum kamboo are much more cultivated now than was the case before the famines in the Tinnevelly, Madura and portions of Tanjore districts. The ryot has become so doubtful of the recurrence of favorable seasons that he considers it safer to raise these crops, though inferior, as they come to maturity quicker. For like reasons, all sorts of coarse paddy maturing in shorter time than superior paddy are cultivated to a larger extent than before. This state of things has not failed to affect the attention which used to be paid to the selection and use of good seed of superior varieties.

(*c*) This is also very important, and my experience convinces me that the exchange of seeds between districts is sure to turn out beneficial. The cultivation of Pe-canam and Tillay varieties of paddy has, I believe, decreased very considerably in Tanjore; and in lieu thereof Sirumanian samba, called elsewhere Mullagi, has come to be cultivated. At present this is the most extensively-cultivated variety there. Tillay and Pe-canam suited the old state of things when the fields used to be more liable to inundation from excessive rain and the then condition of irrigation works. Sirumanian samba, I believe, was introduced from the neighbouring district of Madura into Tanjore. The change has been a very beneficial one. This variety is superior in quality and yields as much, if not more, but takes less time to mature. I think this variety is still not much known in other districts where its cultivation is quite possible and would be advantageous. On the other hand, there are some varieties of paddy cultivated in the Godávari delta which might with advantage be introduced in districts where tank or river irrigation is practicable during portions of the year only, for those varieties take not more than 4 to 5 months to mature, and yet are of superior quality. I myself got some seed from Cocanada and made an experiment in Tanjore. The results were encouraging.

(*d*) From what I have said above it follows that I am very much in favor of selecting and pedigreeing indigenous seeds.

(*e*) It is not easy to suggest practical measures under this head. However, one or two observations occur to me. I am not sure that sufficient care has been bestowed on this point till now, nor am I aware that any systematic attempt in this direction has yet been made. In the first place the seed distributed should be such as will suit the place where it is desired it should be cultivated. I do not know if any other than Carolina paddy, mucca cholum or maize and tobacco seeds have been distributed.

I think much good might be done in this matter if the Tahsildars and the Deputy Tahsildars and other higher Revenue officials could be induced to take personal interest in the matter. In the beginning intelligent landholders should be selected and seed given to them sufficient to sow at least an acre with. It is no use giving ten men indiscriminately one measure of seed each and taking no further trouble in the matter as is the case now. It is better to give the ten measures to one competent individual and convince him of the superiority of seed by making him try the seed. This should be done in the various parts of the country with some persistency, and I have no doubt that if the outturn is good, applications for such seed will increase.

Implements and Machinery.

(*a*) It cannot be denied that there is an opening and a necessity for the introduction of at least some few improved implements such as English ploughs, implements for cleaning and sowing seeds and levelling, especially in dry lands. I believe the plough now used by the ryot for dry land costs between 8 annas and one rupee. Every ryot who has tried improved ploughs admits its superiority, but its cost is almost prohibitive. Effective improved ploughs could be manufactured at a cost not exceeding, say, Rs. 3 each. I think the use of such implements will increase. I know that improved ploughs have been readily hired from the Madura Farmer's Club by some villagers around the town of Madura. Cleaning and sowing implements and levelling chains are, I believe, almost entirely unknown in the Southern districts, and I am sure they will be utilized if people come to know of them. Of course, they should also be manufactured as cheap as possible. As to dry lands, implements of the above descriptions in use at the Saidápet

Farm are quite suitable, but modifications calculated to reduce the cost in parts in which modification is possible without affecting efficiency should be made. I do not believe that any of the ploughs newly introduced are quite suitable for wet cultivation in the generality of lands in the districts I am acquainted with; because the cattle used are of small size. As a rule, except in sandy soils, cattle cannot be used in ploughing wet lands.

The seed-drill will be serviceable for dry lands. The improved country plough whose cost is not prohibitive and the seed-drill may be exhibited at all Taluk offices.

Cattle.

(*a*) (1) The absence of good breeding bulls is one important defect. In former days, Temple bulls existed in considerable numbers. For various reasons these are now rare. By far the greater number of bulls are castrated, and young bulls before castration are the only ones which are used for breeding purposes. No attention is paid to the subject.

(2) The Aden cow or the Punganúr cow, which are of small size and whose feed does not cost much, may be introduced in the South. Aden and Punganúr bulls are hardy and capable of doing good work. The cows yield a good quantity of milk. The Court of Wards may pay attention to this matter in the Estates under their charge.

(3) The disallowance of holdings on grass tax in parts of the country where it used to be allowed, as also the disallowance of remission on fallow lands, have affected cattle breeding in some districts. The operations of the Forest Department are not likely to improve matters. I would recommend the re-introduction in suitable tracts of the Pulvari (புல்வரி) system. I know of no fodder more nutritious than the chola nâthu (சோளநாத்து). I would recommend that a reduced assessment should be charged where cholum is cultivated for fodder alone. This is not unreasonable as no grain is obtained from such lands.

Methods of Cultivation.

(*a*) Fallowing is necessary in the case of dry lands, and this is not likely to take place unless sufficient consideration in levying Government assessment is shown in the case of such fallow lands.

Inducements to Improvements.

(*a*) and (*b*) Exhibitions, strictly confined to the exhibition of agricultural produce, cattle and implements, if held on well-known festival occasions in the various districts and the grant of pecuniary rewards are, in my opinion, likely to be effective.

(*c*) Honorary rewards and titles are also likely to be useful. I know some zemindars in the South who are anxious to earn titles, but do not clearly see their way to it. If such zemindars and large landholders understand that honest and substantial efforts at introducing improvements in agriculture, in their estates will be rewarded with titles, some few at least are likely to work in that direction.

Agricultural Education.

(*d*) They have not sufficient encouragement, and unless they happen to be large landholders themselves, which the majority of them are not, the knowledge they have acquired appears to them useless, for it does not help them to earn their livelihood. A policy steadily pursued of employing persons trained in the Agricultural College as Revenue Inspectors will be a step in the right direction.

(*e*) Elementary education in agriculture, both theoretical and practical, should, in my opinion, be given in all the schools referred to in the question, or at least in the District Normal Schools and Middle Schools. Farms and gardens should be attached to at least one school in the district for purposes of practical instruction.

Farms and gardens should, in my opinion, be also attached to jails in localities where facilities for irrigation and suitable soil exist. I am conscious this is rather a novel suggestion, but I see no serious objection to it, but several advantages.

Private Effort, Inquiry and Experiment.

(*d*) The operations of the Revenue Settlement Department are, in my opinion, ever likely to operate as a check on the devotion of capital to new improvements. Investment of capital on land and its improvement by people who know that ryotwari land is liable to re-assessment every thirty years is likely to become less and less at least until the principles of Settlement become more intelligible to them and more settled in fact.

Land Improvement.

(*f*) The delays and expenses incident to obtaining money from Government are serious hindrances except to the dishonest. The only suggestion that occurs to one is that an officer of the grade of Deputy Collector, of tried ability and experience, should be specially deputed to go over to the villages and explain the law and rules on the subject, make the advances personally and afterwards examine and satisfy himself that the advances are being properly applied. This experiment should be tried in selected districts for some time.

TANJORE, (Signed) S. SUBRAMANIEN.
13th February 1889.

APPENDIX O.

ORAL EXAMINATION

OF RAI BAHADUR S. SUBRAMANIA AIYAR, B.L., C.I.E.

30th March 1889.

Seeds (*b*) As regards my remark as to cholum and cumbu, I have no actual reason to say that the ryots do *not* use the best seeds they have, though the cereals may be inferior; I do not however think that any special care is used in selection, but believe that ryots would do so if their attention were drawn to it.

In Madura, they used to grow a superior class of cholum, cumbu, &c. Since the famine, they have adopted an inferior class; the frame of mind which led them to take to inferior crops instead of superior, would also lead to their taking less care in selecting the best seeds even of the inferior class of cereals. As regards paddy, I don't think that they have gone from a superior to an inferior, but from one variety of superior to another variety of superior, which comes more quickly to maturity. I am not prepared to say that the ryot always acts to the best of his knowledge; I myself have seen this in the case of my agent who is apt to go back in his practice in spite of my continual urging him to care and effort. The ryots seem to have an idea that seasons are now so uncertain that a short-period crop has a better chance of succeeding than a crop requiring a longer period. The great increase in the cultivation of inferior lands may be another reason for the growth of inferior crops; these inferior lands have greatly come into cultivation since the darkhast rules of 1864 or thereabouts.

Well-to-do and intelligent ryots probably take care in selection of seeds, but with reference to paddy, I do not know that any *special* care is taken. Out of the crops on a good field, they select the first thrashing (talayadi) and this they use, but they do not take pains to barter or exchange seeds so as to get hold of the best possible seed; they simply take the best of their own field.

I cannot say directly whether any deterioration has been found from continual in-breeding from a man's own fields. I know, however, that seeds of the same variety are brought from other places, where the irrigation facilities are not so great and where cultivation is also better. I mean lands where irrigation water is actually less in quantity, as under a tank, so that the soil does not become water-logged and is also highly manured. By inferior, I mean coarse and inferior in price, and I hear that it is somewhat less in outturn. I cannot speak as to its quality as a food.

(*c*) I have myself introduced paddy from the Godávari into Tanjore; it came to maturity in 4 months instead of 6 and fetched, I think, about the same price; the yield was about 21 fold; other people bought seed from me after I had done this and did not themselves import. I have heard of a merchant also sending for paddy seed from the Godávari delta to Madras.

(*e*) In my opinion, local farms should be established in various places under the Department, but assisted by private members of a local committee. The original *experiments* should be conducted by an expert only at some central farm; experiments found successful at a central farm should be repeated at these local demonstration farms as much as possible under locally prevailing conditions; if circumstances permit, I should like 3 or 4 central farms in the Presidency in selected localities. I would not equip at present experimental farms as permanent institutions, but would try experiments in various localities, and afterwards they might be made permanent. These local farms would also be centres of distribution to selected private experimenters. But a properly trained man would be necessary at the head even of a demonstration farm. I would encourage ryots' sons to come and spend 2 or 3 months at a demonstration farm and see what was going on and then go back to their own lands.

As regards the "Madura Farm," the three Superintendents had good theoretical training, but they had not sufficient practical training; the theoretical knowledge of the first was inferior to that of the second; these two were not successful; about the third, I have no sufficient information. The second was afterwards privately employed, but did not succeed. Men hitherto trained at Saidápet are not capable of conducting original experiments.

I think that at present a central organization is wanted for aiding effort in local associations, but though there is considerable readiness to form associations for the purpose, yet there is not sufficient initial energy for the spontaneous formation of such societies. After a time, I think

that active aid from the Department would not be needed except by grants of money and advice. I don't think that private associations would start or work local farms, but if local District Boards were directly connected with such enterprises, even farms might be so worked. I want no other official if the Local Boards are connected with the associations. The Local Board in fact would form the only local committee which could at present deal with such an enterprise. The Local Board might contribute funds as connected with education; I do not know that the present law actually warrants such a grant for *farms* as mere farms, though it would warrant the support of farms as educational *annexés* to agricultural schools. Local Boards send students to the Agricultural College, evidently for subsequent use in agricultural schools. No doubt an entirely unofficial farm would be better than one under official control; but as that seems impracticable at present, I would say that there would be no absolute objection to such a connection. I consider that the Local Boards should take up the question, as they are as it were an intermediate agency between Government and the people; half of the District Boards are already elected by Taluk Boards and are directly representative of popular interests.

As regards the entire separation of the Department from the Revenue Board, I would say, if practicable administratively, it would be advantageous to separate it from the Board; as regards general opinion on the subject, I would say that, in the matter of irrigation, specialization is objected to. The person who collects revenue should also control irrigation as regards distribution. On mature consideration, I finally think that the Agricultural Department should be entirely a distinct and separate department, not connected either with Settlement or with Revenue. This, I should consider, the best method if it is practicable under existing administrative arrangements.

Implements (*a*).—When I say that seed-drills would be utilized if people came to know of them, I believe that people would learn to know of them, if they could be exhibited on the local farms suggested above.

Cattle (*a*) (1).—I know personally that, in some cases, dedicators of temple-bulls have been prosecuted. I myself know, as Government Pleader, that there have been three prosecutions from various districts in that the bulls have not been taken care of. These prosecutions were by Police upon private complaint as to the want of control of the animals. I don't think that their apparent disappearance is due to their now being kept under control; no one could keep them under any control as that is against custom; they wander about eating where they please; this is the way in which they become of good quality.

Many bulls are now castrated at an early age; hence good stud bulls are not now readily available. The usual age for castrating bulls is 3 or 4 years, the latter I think. I have myself required *good* bulls in Madura for breeding purposes and could not get one; consequently I am led to keep one. Plenty of bulls could be got, but not good ones. They are castrated at the time that they would be getting mature for breeding purposes.

The persons who would give bulls to temples are usually rich ryots or Brahmins; I think that there is a decided diminution in such dedications from a decay of sentiment on the subject.

A certain number of ryots would certainly pay attention to the use of good bulls if they were provided. I know of a certain amount of demand for good bulls which cannot be always satisfied, as in my own case and that of a recent requirement by Colonel Pennycuick who was unable to get a good bull.

(*a*) (3).—As regards the disallowance of grass-tax holdings, &c., I speak only from hearsay as regards the Ramagiri division of the Dindigul taluk. I believe that the whole of the *pulvari* land which used to be let at $\frac{1}{4}$ assessment is now in occupation on full assessment. The effect of the present system is to throw land out of pasturage into cultivation; the punjah assessment is, I believe, decidedly favorable in that tract. The lands under the *pulvari* system were usually the worse lands; they were not under cultivation as a rule; they certainly produce fodder now that they are under cultivation. By pasturage, I mean wild grass; ryots did not cultivate grass as a crop.

As regards the Forest Department operations, I am not prepared to speak fully; I referred to the existing state of affairs and present results rather than to the future.

Contraction of pasturage has, I believe, led to the diminution in the number of bulls brought to the Madura fair from parts of the Dindigul taluk, including Ramagiri.

It is true that to alter assessment according to crop as suggested for cholanáthu would introduce the serious objection of possible fraud and the evils of constant inspection; this would be very serious.

Methods (*a*).—By fallowing, I mean bare fallowing to give the land rest. I don't think there is any real system of rotation of crops. So far as the imperfect knowledge of the people goes, fallowing is necessary, but if better knowledge is available, it would be utilized if spread amongst the people.

If the ryot could be allowed relief from assessment in case of fallows, he would be tempted to concentrate effort on the remainder.

I do not think there has been any study of or improvement in the rotation of crops. I am not aware that the policy of Government as to *pulvari* has had any effect in inducing better rotation or other better methods.

Inducements (*a*) and (*b*).—I would certainly make use of the great natural fairs and festivals in preference to the present system of exhibitions; they should be more effective and less

expensive. People come to natural fairs as a holiday and for sight-seeing; hence an exhibition, if then going on, would be very attractive. Moreover, the Department should use the same exertion to get the people to *look* at the exhibits as to collect the exhibits; no official pressure would be necessary to collect exhibits at such shows. Samples need not be large. I am personally aware of cases in which the exhibits were merely collections sent for by officials and not *bonâ fide* exhibitions by the growers.

The prize-farm system, if it could be effectively carried out, would certainly be more effective than the exhibition system; I only feared that there would be difficulty in supervision.

It would not be absolutely impossible to ascertain that an exhibit of produce was *bonâ fide* the growth of the exhibitor; he could produce a certificate from some Local Board member or other. The ryot would himself produce his exhibits at exhibitions at local fairs.

(*c*) Honorary rewards and titles ought not to be foreign or Hindustani; "Rajah" for instance is a well-understood term. I know of a particular case in which a great landholder wanted a title and wanted to know how to get it. I suggested expenditure on education. "Rajah" would suit zemindars and noblemen only. Other titles might be thought of which would be understood and appreciated; they might be conferred by Local Governments and as occasion called for them.

Agricultural education (*d*).—I think that if the graduates had gone back to their own lands they might have done useful work for themselves.

I do not mean that all Revenue Inspectors should be graduates of the College; I think it would be an advantage that Revenue Inspectors should be so trained. Next to Karnam and Monigar, he is the person who comes in contact with the people and his agricultural knowledge might thus be brought to bear on the people. I don't know that any part of his duties *requires* an agricultural knowledge, but being in contact with the people, he would inculcate such knowledge to them and thus influence them. I do not think that any special agricultural training is absolutely *necessary* for a Revenue Inspector to give answers to the marginally-noted duties, but 3 and 4 could be more intelligently answered by a person trained in agriculture.

(1) The extent cultivated.
(2) The description of crops.
(3) The estimated condition of crops.
(4) The estimated outturn of the crops harvested.

A preference should, I consider, be given to men so trained, if equally suitable.

For reporting on irrigational questions connected with irrigation sources, I do not think that special agricultural knowledge is necessary; I doubt if his reports would be of any special weight even if he were an agricultural expert; they might be more valuable.

For petty estimating work, such as a Revenue Inspector is often called upon to carry out, no doubt he could do better if he had special knowledge in estimating, &c. So, as to subdivision of holdings and placing of stones, his knowledge of mensuration, &c., as gained in the College, should be decidedly useful.

So also in reporting on the state of the health of cattle, &c., a Revenue Inspector would, if trained as an agriculturist, be more useful than if not so trained.

If a Revenue Inspector has to do with *maramut* work, he ought to have a special training in such matters.

Nor could he look after the arboriculture of his circle without knowledge of trees.

In many branches of his work, he would be the better for a special agricultural training.

By practical knowledge, I mean object knowledge in connection with agriculture; *e.g.*, if there were a garden, I think the boys should be turned into it and made to work in it. It is to prevent every boy from turning to book-knowledge that I would have this; it need not be compulsory. I am sure that many would take advantage of this work for some part of every day. Lecture table demonstration and object lessons would be decidedly advantageous in Middle schools and would be adopted in such schools. Where a specially trained man is available, a school-garden would certainly be a advantage to a Middle school; on financial grounds, I think it is impracticable, but not on other grounds; if finances don't interfere, it would be perfectly possible for such schools to combine theoretical and practical teaching. I do not mean that the minutiæ of technical agriculture should be taught to a boy, but merely that what was taught in the school-room should be explained in the school-garden. I refer not to lads who are to be trained technically as farmers, but to the spread of general agricultural knowledge among the educated public; we could, of course, have demonstration in surrounding fields, and a garden is not an absolute necessity for demonstration.

I am in favor of at least one agricultural school proper of the *primary* standard in each district. I would attach it to the place where the local farm is to be established, and would attach the school to the farm if possible. I don't know whether it would interfere with the proper working of the demonstration farm. By "attached" I mean contiguous, not under the same controlling authority; they should be worked separately. Rural teachers after being trained theoretically at the Normal School should or at least some of them get practical instruction for, say, a year at the farm. If he gets no practical training, he could not teach agriculture.

To superintend local farms, I think, the superintendent should certainly have gone through at least the full Saidápet course, that is, the least qualification.

Jail farms and gardens would be for the improvement of the prisoners in the growth of various crops; not merely as now, I believe, in growing vegetables. The superintendent of the local farm might occasionally visit such farms and give advice as to management, so that prisoners would gain some new knowledge and take it with them to their homes. The use of poudrette, for instance, could be practically taught there; I have seen the night-soil uselessly conveyed to a great distance and simply buried instead of being utilized.

I don't know that it is a valid objection to agriculture in reformatories that it would conduce to want of discipline. Garden growth of vegetables may be availed of to teach a good deal in the matter of agriculture; but a boy should preferably be taught a mechanical industry rather than agriculture only.

Private effort (*d*).—I referred to the question of classification in my answer to the detrimental effect of the Revenue Settlement Department. In my own case, I bought a ruined village and put it into good repair at great expense; now, if it is to be assessed like surrounding lands without taking into consideration my expenditure, this will be a tax on improvements. I had to fill up immense excavations and dig a drainage channel, &c. I then believed that the Tanjore Settlement would not be proceeded with, whereas it is now going on.

If the *grain-valuation* or classification of the land is fixed as now stated and future changes are only to be upon a change in prices, my objection may probably be withdrawn; my objection is justifiable on the ground that these facts are not generally known. An abstract of information of this sort might be printed on the back of pattas or otherwise communicated.

It is also true that Government 4 per cent. paper is now being preferred to land as an investment, because the interest is better, because it is more easily realized, and because the rights of coparceners in such moveable property are not so directly apparent.

My experience is confined to a hitherto unsettled district (Tanjore). I cannot speak with reference to other districts as to whether persons have been deterred from making improvements.

Land improvement (*f*).—By the word "expenses," I mean improper expenses, such as fees to obtain a favorable report. The Revenue Inspector, for instance, would be likely to get fees; it is against them rather than against Tahsildars that I have heard complaints; but for this, I think, persons would freely come forward. I don't think that the influence of the sowcar would be an obstacle in the way of taking loans. Elasticity in rules would also be an improvement.

APPENDIX P.

REPLIES TO THE INTERROGATORIES OF THE AGRICULTURAL COMMITTEE, BY DEWAN BAHADUR R. RAGOONATHA ROW.

Seeds.

(*a*) to (*f*) There is no absolute need for introducing fresh and exotic seeds; but their introduction may be tried, and the best method of trying it is to procure really good seeds and give them to large land-holders to try them and report the result.

Implements and Machinery.

(*a*), (*b*), (*c*) "Implements and machinery, new ones," will not succeed until workshops are established within small distances from the village, and unless the implements and machinery are sold for some time at their prime cost and repairs done to them cheaply.

Cattle, Sheep and Horses.

(*a*) There is no doubt that there is a great need for improving these; but so long as the present Forest rules and those of the Revenue Settlement Department remain in force, depriving people of pasture land, nothing towards the improvement of cattle, sheep, and horses will succeed. Veterinary science should form a part of the general education and Government should establish veterinary hospitals until private practitioners start them up.

(*b*) No separate department need be formed for this purpose.

(*c*) Remove the hindrances for private stock-breeding, viz., want of pasturage and income-tax on the stock-breeders, the stock-breeding will take care of itself and be prosperous. All that trade requires is to let it alone unhindered. It is sure then to flourish.

Methods of Cultivation.

It is to a great extent complete in India; but none will improve agriculture so long as he is not confident that the land is his, and his tax thereon improved by the Government in proportion the land is improved by him.

(*a*) As no fallow lands are allowed, or as tax is not reduced into half or one-third according to the poverty of the soil, particularly dry land, such lands will not be coveted by a good agriculturist.

(*b*) Nothing need be done by Government beyond removing the aforesaid hindrance to secure manure and manuring. It is a patent fact that all lands in India cannot be manured.

(*c*) Rotation and growth of mixed crops are not unknown to land-holders. Nothing special need be done to improve them except giving them scientific lectures and distributing tracts on the subject in the vernaculars, written not by modern educated people but by land-lords in affluent circumstances and in the colloquial vernaculars.

(*d*) There is not much to teach the people on irrigation and the economical use of water; surplus water is invariably let out by the cultivators. If the Government would only see that the outlets for the surplus water of one field or village are utilized for the irrigation of another field or village, there would be no waste of water.

(*e*), (*f*) and (*g*) Cultivators are not in want of much useful information on after-cultivation. Harvesting operations, including preparation for market, and special crops as these, will be well attended to and improved by the conduct of the producer, consumer and their middlemen, the merchant.

Inducements to Improvements.

(*a*) to (*c*) Inducements to improvements by exhibitions have not been very successful. Until security of tenure is vouchsafed to the land-owners, no inducement worth the name can be offered for improvement.

(*d*) Markets and roads are absolutely necessary. These would prove good inducement for the minimum improvement, which alone is possible under the existing system of land-tax.

Agricultural Education.

(*a*), (*b*), (*c*) I know so very little about the class of men sent to Saidápet College, the method of their selection and the objects of their being sent, or of their application to be sent, that I shall say nothing about these subjects.

(*d*) Regarding the results of their education (1) upon themselves as agriculturists or public servants, I have reason to believe that the results have been satisfactory, but I cannot say the same (2) upon the progress of agriculture. There may be some infinitesimal improvement, if any.

(*e*) and (*h*) I am of opinion that general education should include elementary education in agriculture. It should be theoretical in the school, and the schoolmaster should take the students to the nearest field and explain the theories there, which will be a sufficient practical education.

(*f*) and (*g*) I am not for experimental farms and stations.

(*i*) Text-books are necessary. They should be simple, refer to fundamental principles, written in simple language and in the colloquial vernaculars.

Agricultural Inquiry.

No agricultural inquiry will, under the existing circumstances, be of much use. The fundamental principles of political economy will adjust everything, provided hindrances and interference on the part of Government do not disturb their laws. Respectable land-owners should be requested to supply all information wanted, and their statements may be relied on.

Agricultural Societies or Clubs.

When the hindrances, above referred to, are removed, Agricultural Societies or Clubs will naturally start themselves up. I am not aware of such clubs existing now anywhere. I know M.R.Ry. A. Sabapathy Mudaliar of Bellary and another Mudaliar at Shiyáli have been doing the work of such clubs so far as they have been able to do.

Land Improvement.

As regards land improvement I have already mentioned what my conviction has been. No one will repair another's coat. So land will not be materially improved so long as the holder thinks that it is not his own property but that of Government. Improvements are not left unmade for want of capital, or for want of facility for borrowing. Government may lend, like any merchant on the security of the land, money to the land-holder for its improvement. I do not think that many will at any time borrow from Government. I am sure they will not borrow from Government under the existing rules, which are more disadvantageous to the borrower than the rules of the worst usurer practically are.

Irrigation Wells.

On the subject of irrigation by wells the Government have of late been very unwise. No increase in the land-tax should ever be claimed if the land-owner gets better crop by irrigating the land from wells dug by himself. Until this rule is enforced, not theoretically but really and practically, land-holders will not sink wells.

Other Industries.

What I have said about the improvement of agricultural industry is equally applicable to other industries. I say "let them alone, don't put obstructions in their way by trying to benefit Government by direct taxation thereon or by legislation, industries will spring up and flourish provided they are paying ones."

KRISHNAVILAS, MYLAPORE,
6th February 1889.

(Signed) R. RAGOONATHA ROW.

APPENDIX Q.

ORAL EXAMINATION

OF DEWAN BAHADUR R. RAGUNATHA ROW.

4th April 1889.

Seeds.—Carolina paddy was successfully grown, but as there was no proper demand for it then, it was discontinued. It may now be re-tried as there are greater facilities for export. The Carolina paddy has a large grain, whereas small rice is locally approved. It gave a larger outturn. It would be successful if the public got to like large grain. But experiments should not be made a task to the experimenters; at present, the demands made upon the time and attention of experimenters are so great that they deem it an annoyance, and they declare an experiment to be a failure to avoid trouble. Persons are better fitted now for experimenting.

Implements and machinery.—The great difficulty is the want of a workshop; foreign machinery has been imported, but found to cause loss, because if a single screw failed or was lost, the whole thing got out of order. I have had personal experience of such case in the matter of a small press which I got from America. I would sell implements at prime cost just for a time to induce a demand: Government should do this. But first of all, there must be some method of providing for repairs. I cannot myself suggest any practicable method: the Railway Companies might be negotiated with, so that in connection with their workshops, Government might provide here and there small workshops where implements could be repaired. It is not sufficient for Messrs. Massey and Co. to train up-country smiths. I don't think that the establishment of Industrial Schools in connection with Normal Schools would provide within reasonable time smiths who would be capable of making such repairs. The cost of the workshop would probably have to be borne by Government, because the Railway Company would have to establish more shops than they have now.

I don't as yet think that we can expect native workshops to be started or to be a success: it would be better, at least at first, to utilize the Railway workshops.

Cattle, sheep and horses (*a*).—Forest rules operate against cattle-breeding in this way, that cattle used to be driven into the forests freely, whereas now they are not so allowed. All that is necessary is to provide proper supervision and control over grazing cattle. Forests should be divided into two great branches: (1) those into which all entrance is forbidden, (2) those into which it is free: supervise the first by the technical officers of the Department, and have the second free for grazing, getting of fuel, &c.

This may be the rule in theory already, but the practice is different: the principles of the rules are excellent, but the practice has done much harm. The theory should be given more effect to; the desire for showing profits greatly interferes with the due working of the principles. It may be occasionally the case that the closure of forests has led to an extension of private planting; possibly to supply fuel for the Railway.

As regards Revenue Settlement rules, they are objectionable, because they take away all pasturage; whatever the rules may be on paper, they do not in practice allow free pasturage. I speak with a knowledge of Trichinopoly, Tanjore, Coimbatore and Kurnool; I served as a Deputy Collector in these districts: in none of these is pasturage set apart as poramboke, *i.e.*, unassessed. In my villages in Tanjore, not a single acre so allotted can be seen: I have lands both in wet and dry parts. I should modify my words to include the Revenue Department, not Revenue Settlement only; the Revenue rules have been the ruin of cattle in India. Open pasturage is absolutely necessary for cattle: there must be a common place where cattle can get exercise and grazing. Common pasturage is not objectionable on the ground of disease: if an animal gets rinderpest or other disease, it is always customary to separate the diseased animal and drive it to a marsh and then make it stand in it; that is the practice where there is a place available and the people can afford it. Segregation is practised even where there is no marsh available; such cattle would return to the houses at night if there is any danger of their being lost.

Every one should up to a certain point have a knowledge of Veterinary science: it should be introduced in all schools as a matter of general education; elementary principles might easily be taught theoretically, just as hygiene. Every man should know something so as to be able to treat his own cattle. I do not consider the ordinary ryot is able to deal successfully with cattle as he would be able to deal with them if taught as I have suggested. Village officers should, in connection with the educational tests now proposed, obtain some such knowledge.

Veterinary hospitals should be as numerous as possible, and if successful at all, they would soon be taken out of Government hands.

(*b*) I don't want any separate Department, even for cattle disease prevention, as it involves multiplicity of inspections which are a great bother.

(*c*) Stock-breeding certainly flourished a few years ago better than it does now; from my own experience I can give an example. I had 100 head about 30 years ago; the small remainder of about 25 have now been sold, because it was too expensive to feed them as food has now to be bought, pasturage being no longer available. Pasturage is now no longer available because the area has been taken up for cultivation; it has also been reserved. In my own case, the cattle used to graze in a small jungle which is now wholly cultivated; that is in the Tanjore district; it was brought under cultivation by the operation of the Revenue rules, viz., the durkhast system under which each year there was an enquiry caused by persons who offered to take up the land; to avoid all this, we ourselves took up the land and put it under cultivation in order to keep free of annual annoyance. I consider that the retention of pasturage is more important than the extension of cultivation.

Everywhere stock-breeders are taxed under the Income Tax Act; they are taxed when they bring cattle for sale; they are not taxed *quâ* breeders, but as there are no breeders apart from dealers, they are taxed as dealers: I speak as regards my own experience as a Revenue officer. I do not know of any cases where dealers are separate from breeders. My remarks refer only to *sheep*, not to cattle; as regards cattle, however, I believe that, except in Nellore, the dealers in cattle are generally the breeders also.

Methods of Cultivation.—I think the method of cultivation is pretty perfect. Regarding my remark that there will be no improvement so long as the ryot is not confident that the land is his, I refer to the High Court judgment that a man can be turned out of his land at the end of any year; see High Court Rulings, Volume I, Madras, page 205, Fakir Mahomed *v.* Tirumalachariar (1876, 28th November).

I am aware that no one is in practice turned out by Government, and compensation is always given when he is so turned out. What I mean is that the ryot should be uncontrolled owner of his land except as regards the duty of paying assessment on the land. Private property is the result of a limitation of the tax. A ryot owns his land as against all private claimants; it is only not his as against Government. Government limits his ownership by being able to revise the land-tax at the pleasure of Government and also by—as I understand the case—its legally declared ability to turn out a ryot as a tenant-at-will. I object to the increase of tax without the ryot's consent; so long as his rights are limited in this way, I do not consider that there is private property in land, and therefore I believe that there will be no improvement in land. The land-tax should be fixed in *grain*, not in money; any increase in produce should be the ryot's own. I approve of the principles now read out to me as the principles of the Settlement Department; if carried out into practice, they are admirable; they exactly carry out my idea, viz., a permanency of the grain-valuation.

(*a*) Fallow is necessary to certain lands and this should be allowed for in assessing the lands; a ryot must allow certain lands to lie fallow, and if he tries to get anything out of them in order to pay the tax, he will meet with loss.

(*c*) It is possible to prepare tracts and give lectures as I have suggested; there are plenty of persons who could lecture and prepare the tracts; half-a-dozen in each district. Science should be taught in plain language in schools; vernacular tracts should be prepared in similar plain colloquial language and issued; at present, the language used by modern educated men would not be intelligible to ordinary ryots. There are, however, people who could prepare such tracts.

(*e*), (*f*), (*g*) I would leave all these matters to self-interest which will be sufficient.

Inducements to Improvements (*a*)—(*c*).—The truth is that people have no confidence that orders once given will be considered binding. I instance the fact that it was authoritatively declared in Sir Charles Trevelyan's time that the existing Tanjore Settlement would not be carried out, whereas it is now being carried out.

The Settlement is regarded as a means of getting money anyhow.

Agricultural Education (*d*).—I can recollect some slight improvements as the result of advice and information given by the graduates of the College; there has been some awakening of interest. There cannot, however, be much effect from these men who only go to the College as a means of getting their own livelihood, and not of getting a real knowledge of the art.

(*f*) and (*g*) I don't think that at present experimental farms would give any result commensurate with expenditure. I do not object to them *per se*, but only on the present condition of the country.

(*i*) There are persons who could write such text-books; I know of landholders in Tanjore who could do so. I could furnish names on consideration.

Agricultural Enquiry.—Self-interest and self-help are sufficient motors for progress. There are ample accounts available showing the produce of land for many years; I have accounts myself for the past 50 years; these if available would give full information, but are not the present sources of Government information.

Agricultural Societies.—There is too much suspicion now to allow of such societies; the moment any suggestion is made, it is suspected that some new tax or other is under contemplation. Societies that owe their origin to the initiation of Government would be merely galvanized into a fictitious energy.

Land Improvements.—The rules now in force are too rigid and too strict; repayments are demanded to the exact day and recovery of dues is so easy to Government, whereas it is not so to the private usurer.

I do not consider that very much money sticks on the way to the borrower; some may, especially when the paying officer is less in status than Tahsildar.

Wells.—Some 20 or 25 years ago, it was the rule that no well should be taxed; about that date, it was laid down that lands under wells near channels and irrigation sources should be subject to water-rate. I don't know whether those rules have been abrogated in recent years, as I am not aware of the latest history of the case. If restrictions have been removed, I am very glad to hear that the objection I refer to does not exist.

Other Industries.—The best course in industries is simply to leave them alone; even for agriculture, I am of this opinion.

APPENDIX R.

Letter from the Rev. F. W. GOSTICK, to the DIRECTOR OF PUBLIC INSTRUCTION, with covering letter from A. MUNRO, Esq., Inspector of Schools.

RURAL AGRICULTURAL SCHOOLS.

From A. MUNRO, Esq., Inspector of Schools, Fifth Division, to the Director of Public Instruction, Madras, dated Kodaikánal, 28th November 1887, No. K—1.

I have the honor, at the request of the Rev. Mr. Gostick, to forward the enclosed letter (requested to be returned).

2. Mr. Gostick, who is not only a Mechanical Engineer, but also a man of some experience of agriculture, both in England and in India, points out the defective methods of agriculture in this country, such as unkempt hedges, large uncultivated borders, surface-ploughing. He observes that the Agricultural College is too remote and not sufficiently in touch with the people to be of much use, and that model farms are too elaborate and expensive He suggests that with the view of improving the condition of the ryot "the knowledge must be taken to the place where it is most needed, viz., the village. Agricultural education should commence in the village agricultural school."

3. I fully concur in Mr. Gostick's views. In a country, the population of which is mainly agricultural, the education imparted should have some special reference to agriculture. Hitherto the literary education which has been given in rural tracts has been of little use, as it rarely goes beyond the 3rd standard, if it goes so far. The reason for it is that the ryot sees no practical advantage in education divorced from agriculture, which is his staff of life. It is different in the case of towns, where education means the passing of examinations, which lead to lucrative employment. What is wanted is some system which will bring education home to the ryot, by associating it with his daily occupations. The system proposed by Mr. Gostick seems to meet this object. Ultimately I think every Village Union should have its agricultural school, with its acre of land, improved ploughs and other implements, the manager being the head of the village. The scheme proposed by you of making village munsifs, karnams and monigars pass some examination will lead to make these officials to take an interest in their schools, and try to push them on. I would make the passing of the 3rd standard a condition of entry to the agricultural school, as some little knowledge of reading, writing and arithmetic should precede the study of agriculture, and I would have instruction in the 4th standard given side by side with instruction in agriculture. Adults might attend the night school without any such restriction. The alteration in the hours of study suggested by Mr. Gostick, viz., from 12 to 3 and from 6 to 8 is a good proposal, as most schools in rural tracts are closed for a third of the year for harvest operations. Schools of the kind suggested by Mr. Gostick might, in the first instance, be opened in every district as an experiment, and, if they prove a success, might be further extended to Taluks and Unions. As regards the support of these schools, I have no doubt that District or Taluk Boards would contribute towards their cost and I believe that in some cases rich zemindars and mirassidars could be induced to found them. A mirassidar in the Shiyáli taluk expressed to me his willingness to start some such school, and I think that others would come forward if an impetus were once given by Government to the movement. Small fees might also be charged.

From the Rev. F. W. GOSTICK, Wesleyan Missionary, to the Inspector of Schools, Fifth Division, dated Mannárgudi, 9th November 1887.

My work as a Christian Missionary lies principally in the dry land district to the south of the town of Mannárgudi in the taluks of Mannárgudi and Patukóta, and in my recent tours I have been increasingly struck with, what I may term, the helplessness of the people. I had almost said poverty, but though these people are poor, the poverty is not grinding, neither is it a necessity, not being due either to crowding, poorness of the soil or heavy taxation. Nor is it due to laziness, as I at first thought, for though these people do not work more than half their working time, still they are not unwilling to work. The fact is they are a shiftless race, and here lies the root of their poverty.

This will perhaps be doubted and instances given of some of their really ingenious devices in agriculture and other pursuits, but such devices are the remains of a former race; the present men put forth no new effort. This state of things can be traced to its source in the many years of despotic rule which they have endured.

To look more closely, on visiting the dry land villages south of this place, what one is first struck with is the untidiness of the cultivation; unkempt hedges; three or four pathways through one small field; large uncultivated borders and corners to the fields; to say nothing of useless trees and shrubs left growing in the plots. Such things are to be seen by the most casual observer. Then if the land be examined it will generally be found patchy, or there will perhaps be seen a strip of brackish, sandy soil (கரம்), in which nothing will grow, running right across a field without any attempt to reclaim it.

The crops themselves everywhere give evidence of this in their varying hue and differences of growth in the same field. It is no uncommon thing to see four or five shades of green in blotches over the same plot.

Again, if the earth be turned, it will be seldom found that it has been ploughed deeper than four or five inches, even that being done most unevenly, with ridges of from three to five inches between the narrow cuts of the native plough. An ordinary shower, which, if the land were properly cultivated, would last, say three weeks or a month as moisture for the crop, runs off the land and is wasted.

The sub-soil, so far as I know, is never upturned to the action of the sun and there is on these dry land holdings next to nothing of rotation of crops, and thus the surface-soil is year by year more impoverished. The people put the blame on the Government for taxing them and on Providence for not sending rain.

What I have said is nothing new. It has often been said before in different ways, but the fact that so little has been done to alter this state of helplessness amongst the cultivating classes makes it necessary to repeat and repeat until some remedy is found. This people will never be contented or prosperous until they are taught to utilize the land better, and also some of the elements of agricultural thrift.

How can this be done? The Agricultural College at Madras is, there is no doubt, a capital institution and in the future will make its mark upon the country, but for many years to come it will not come into touch with the people. It is too advanced, and too expensive for the purpose in hand. Model farms again are useful and important schools for Government, laboratories for experiment; but the ryot does not want experiment but the teaching of a few simple facts. Model farms in this country cannot be expected to be made to pay for many years. The ryot must be shown something that pays. He needs to be taught a few of the best known facts of agriculture, and even more than this, he needs to be taught how the knowledge of those facts may benefit him. This kind of teaching cannot be done in large centres, in High Schools and Colleges. The ryots whom it is necessary to teach will not come to such schools and, if they do, will not afterwards settle in their villages. The knowledge must be taken to the place where it is most needed, viz., the village. Agricultural education should commence here, in village agricultural schools.

The general education scheme has of course to embrace all classes, and this makes it alone inadequate to any special class. But here, in the above schools, the aim would be to reach a special class, and the education given could therefore, in all things, be suited to the distinct needs of that class. Even the school-houses should be made suitable to the ryot. I would suggest schools on something like the following rougly-sketched plan.

Day school for boys from 12—4 and night school for adults from 7—9, both schools working up to what should be called a Fourth standard. For this the following might be the scheme:—Arithmetic up to compound rules, bills of parcels and simple book-keeping, writing, geography of the Madras Presidency with special reference to agricultural products and customs; and an agricultural class book containing lessons on the following:—Land and its uses; crops of the country; seed-grain and its growth; preparation of the land; farm-implements and machines; cattle; ploughing, harrowing, &c.; sowing, planting and weeding; manuring, irrigation, &c; hedges and paths; rain, rotation of crops; sub-soil ploughing; cows, sheep and poultry; trees, fibre, &c.; buying and selling; accounts; Government. Such a class-book would give sufficient scope for teaching, reading and meaning of words.

There should be no optional subject; but attention should be fixed on the above essentials, and in these a thorough grounding should be given. Every such school should be supplied with one small improved plough, small harrow, bamboo seed-drill, one mamoty, one pick and one box of samples of grains. Surrounding the school-house there should be about an acre of land, with an ordinary well, and easy water-lift; bullocks could be hired for a short time each week. An essential point of the scheme should be that one hour's practical lesson should be given outside every day.

Such a scheme would reach the very class which it is most necessary to reach, viz., the working ryot. Agricultural reforms will have to commence amongst this class. The large holder of wet land will make no change; all change for some time must be to the weakening of his power and the reducing of his returns. Reforms will have to commence on the dry lands. By improving these dry lands and increasing their outturn, the wet land cultivators may be led to see the ultimate advantage of growing dry crops on better soil, and thus setting free some of the water now used almost exclusively on rice. The scheme would not tend to scatter the villagers from their homes, as a higher scheme of education would. It would be amply sufficient for the present and could advance with advancement of the ryot.

It will be asked, where are the teachers to meet the demands of such a scheme, and this, I grant, would be a difficulty at first, but could be surmounted. It must be remembered that the difficulty will be met with in connection with all technical schools in this country for some time to come. A too high class of teachers would be a great mistake at first; as also would be one who had been trained on an experimental farm. Such young teachers would, when left to themselves, find it difficult to decide between theory and fact.

At present what is wanted is a knowledge of the best proved facts, plainly and practically taught; and for this purpose, there are many men available, who, if possessed of such a class-book as is sketched above, would be found fully capable.

How is Government to help in such a scheme? By grants toward buildings, furniture, implements, &c. By result grants and by a scholarship in the Madras Agricultural College to the best pupil in a group of, say, ten or twenty village schools. Also by making it compulsory for village officials such as munsifs, karnams and others to pass the Fourth standard of such schools.

As a Christian Missionary I am anxious, alongside with my higher work, to do what I can for the material welfare and prosperity of the people of this land, and I should be glad to commence a few such schools during the month of February next in the taluks of Mannárgudi and Patukóta, if Government could give half grants towards the initiatory expenses of each. Such expenses would be about as follows:—

	RS.	A.	P.
1 Acre land	50	0	0
Erection of school and house	200	0	0
1 Plough	4	8	0
1 Harrow	4	0	0
1 Seed-drill	2	8	0
1 Mamoty	1	0	0
1 Pick	1	0	0
1 Seed collection	3	8	0
Well digging and building	200	0	0
1 Water-lift	10	0	0
8 Forms	16	0	0
1 Table	4	0	0
Teacher's chair	3	8	0
Total ...	500	0	0

Thus the grant asked from Government on each school apart from results grant would be Rs. 250.

If the above rough sketch should meet with any approval, I shall be glad, if necessary, to assist in filling in details.